

South Carolina Air Quality Annual Report

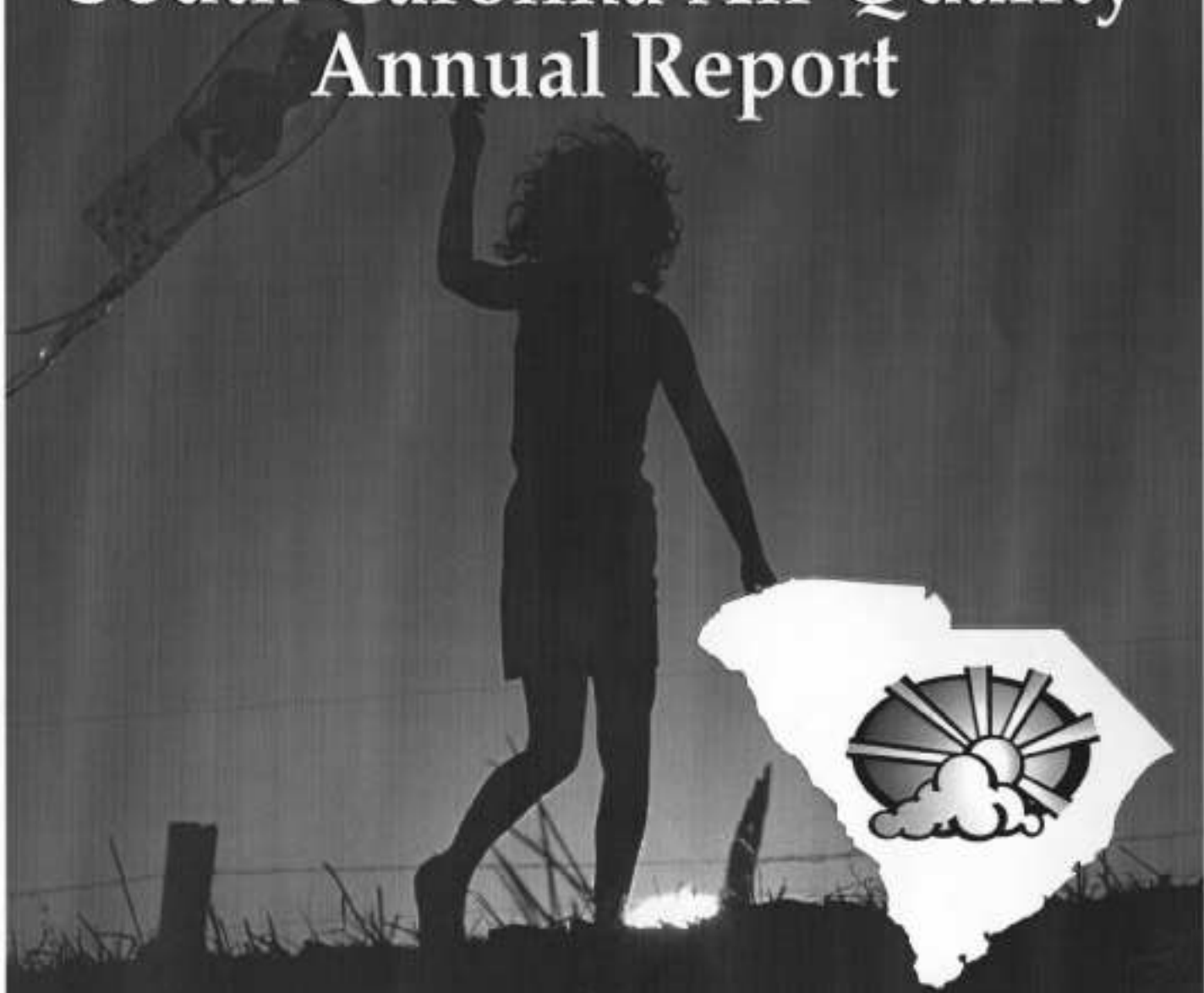


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Introduction

Air quality has a direct effect on human health and the environment. Our need to breathe provides a direct exposure pathway to the presence of any air pollution. Potential adverse health effects include asthma, emphysema, and heart and lung problems. Air pollution can also cause significant damage to our environment. Examples are impaired visibility, premature deterioration of buildings and statues, and lake and stream acidification. There are many factors that influence air quality in South Carolina. They are population growth, industry, transportation, commercial development, geological and topographical factors, and meteorological trends.

The South Carolina Air Quality Annual Report is published to provide an update of the yearly status and significant events in air quality throughout South Carolina. The report's purpose is to inform the public about statewide air quality, any exceedances of ambient air quality standards, progress in attainment or maintenance of standards, health hazards of air pollution, and public participation opportunities in air quality. The report provides information and suggestions on how individuals and communities can help us improve the air that we breathe. No matter where we live, what we do, or who we are, this report provides a common base to focus on what we need to do to protect and improve the air quality environment of South Carolina.

This report is divided into sections representing the services provided by the Department of Health and Environmental Control (DHEC) Air Quality program. These services are delivered through the cooperative efforts of central office, district, and air laboratory personnel. The central office plans and implements programs, provides technical services, issues permits, and ensures compliance. The district offices conduct source inspections, air sampling, field patrols, and respond to public complaints and concerns. The air laboratory maintains the statewide air quality monitoring network, assures the quality of the data collected, and makes the data available to the public.

This report also highlights the successes achieved through the efforts of many partners. The Air Quality program works cooperatively with other Federal and State agencies in protecting South Carolina's air quality. Air Quality program efforts for pollution prevention activities and waste minimization are coordinated with the DHEC Center for Waste Minimization and the Small Business Assistance Program (SBAP). Other organized efforts include working with the Department of Commerce to assist with the location of new industries in the State, the Forestry Commission to address forest management issues via prescribed burning, and the Department of Transportation to address conformity issues. Public input from stakeholder groups is sought during the drafting and/or revision of program regulations. Input from industrial and environmental interest groups is also encouraged so as to maintain an open dialogue on ways to improve and more effectively provide our services.

Planning and cooperation between government, industry, environmental interest groups, and the public have allowed for the current success of the South Carolina Air Quality program, ensuring that our citizens and visitors will enjoy excellent air quality in the years ahead.

Mission Statements

"The mission of the South Carolina Department of Health & Environmental Control is to promote and protect the health of the public and the environment."

"The mission of Environmental Quality Control is to preserve the environment and protect health to maintain and improve the quality of life that makes South Carolina an attractive place to live, work, and enjoy."

"The mission of the Bureau of Air Quality is to conserve and enhance air resources in a manner that promotes quality of life."

To support its mission, the Bureau of Air Quality assures responsible stewardship of air quality and provision of customer service by:

- Protecting and improving air quality within the limits described by State and Federal laws and defined in permits, licenses, and certifications;
- Monitoring and sampling specific air pollution sources and the ambient environment; ensuring compliance through inspections, investigations, technical assistance, and enforcement actions;
- Assessing the impact of environmental emergencies while providing a timely response; conducting programs designed to resolve air quality issues;
- Administering an inspection and certification program for asbestos renovation and demolition projects;
- Responding to requests for information and to other air quality concerns;
- Designing and implementing emission control regulations;
- Issuing construction and operating permits to sources of air emissions, inspecting sources to determine compliance with State and Federal regulations;
- Taking enforcement actions when appropriate and voluntary compliance cannot be obtained;
- Monitoring ambient air quality to assure that standards are being maintained.

The activities described above are provided by the cooperative efforts of the central office, district, and air laboratory staff.



PROMOTE



PROTECT



PROSPER

Publication Acknowledgements

A special thanks to the following individuals for their contribution to this publication.

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(Continued Page 5)

Public Participation & Information

Public Participation

Public participation is encouraged to aid the State in implementing a plan or program which will be cost effective, environmentally compatible, and have the widest public acceptance and opportunity for implementation. The issues that are involved in addressing environmental problems and in expenditures of large sums of tax revenue are often sensitive and frequently result in conflicting views from varied interests. Although the primary responsibility for administering air pollution control and abatement programs rests with governmental agencies, public involvement in the decision making and implementation process is desirable and necessary. The intent of public participation is to promote cooperation and mutual trust between the public and governmental agencies in an effort to restore and maintain the nation's environmental assets.

Public Involvement

A variety of Federal and State laws give citizens the right to comment on regulations, permit applications, and other proposals before a State agency can put them into effect. The Air Quality program takes the citizens' right to comment seriously. We continue to look for innovative ways to involve the public more effectively in developing and promulgating regulations and policies and in reviewing permit applications. Interested parties can get involved by first being aware of regulations and policies under development; participating in or attending advisory committee, stakeholder, regulatory negotiation, or public information meetings on regulations; commenting on regulations when they are formally published for review; and, presenting comments at public hearings. Early involvement in the process is a key to effective and successful participation.

Public Hearing

State Agency Rule Making and Adjudication of Contested Cases, S.C. Code of Laws, Chapter 23, §1-23-110, provides for notice and public hearings prior to any action by the Board of Health and Environmental Control. Actions taken by the Board may relate to adoption, amendment, or repeal of regulations and standards, adoption or modification of final compliance dates, and other specified legal actions. A thirty (30) day public notice is required before a public hearing. A comment period of at least thirty (30) days is also provided concurrent with the public hearing notice. Additionally, public notice and opportunity for comment are required prior to issuance of significant industrial permits.

Public Information

Information can be accessed via the World Wide Web. The Bureau of Air Quality (BAQ) Home Page address is:

http://www.state.sc.us/dhec/baq_home.htm

The BAQ Home Page provides current information on air quality programs to assist industries, small businesses, consultants, governmental agencies, teachers, students and the general public. Information is available on:

- General air quality facts
- Permit application forms
- Modeling software, meteorological data, and modeling questionnaire
- Emissions Inventory forms, guidance documents, and software updates
- Asbestos information, demolition and project notification forms
- Accidental Release Prevention Program [112(r)]
- Telecourse and workshop listings
- Small Business Assistance Program



This list continues to grow, so look for new information on the BAQ Home Page.

Additional information on health and environmental issues can be accessed through the DHEC Home Page (<http://www.state.sc.us/dhec/>) or by phone at (803) 734-5000. Environmental information can also be accessed through the Environmental Protection Agency Home Page (<http://www.epa.gov/>), by phone at (404) 562-8357, or by fax at (404) 562-8340.

The Office of Environmental Quality Control (EQC) maintains an electronic bulletin board that contains environmental information, including most of the air quality information found on the BAQ Home Page. The equipment necessary for access is a personal computer and a modem. Users can access the bulletin board with the following steps:

- Set communication software to N81.
- Dial access telephone number (803) 734-3752 or (803) 734-4535.
- Press “Enter” to activate screen menu.
- Follow menu directions to obtain desired information files.

A systems operator can be contacted from 8:30 am to 5:00 pm by dialing (803) 734-4639.

(Continued From Page 4)

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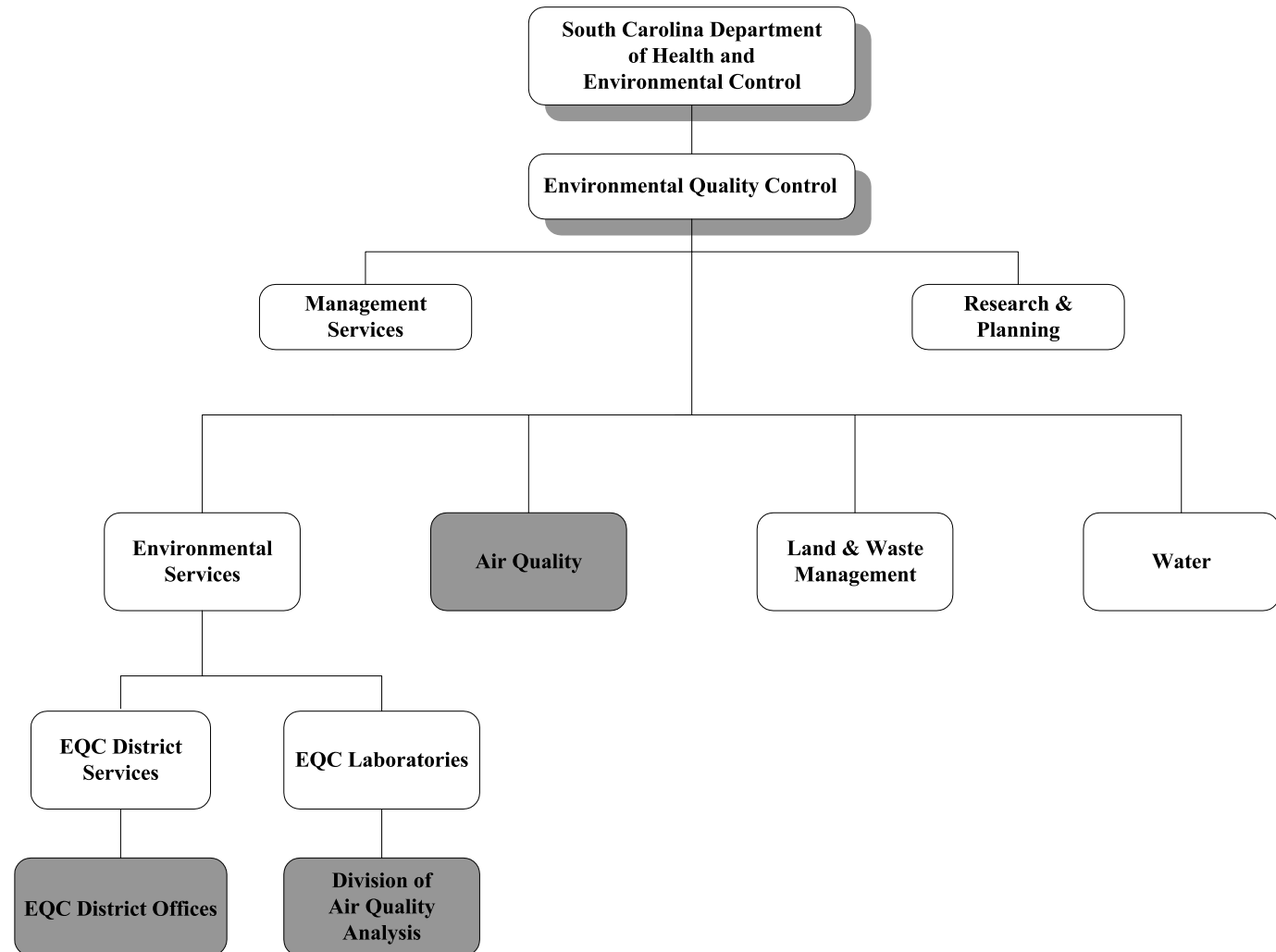
Distribution

Additional copies of the 1997 South Carolina Air Quality Annual Report can be requested by fax at (803) 734-8748 or by writing to:

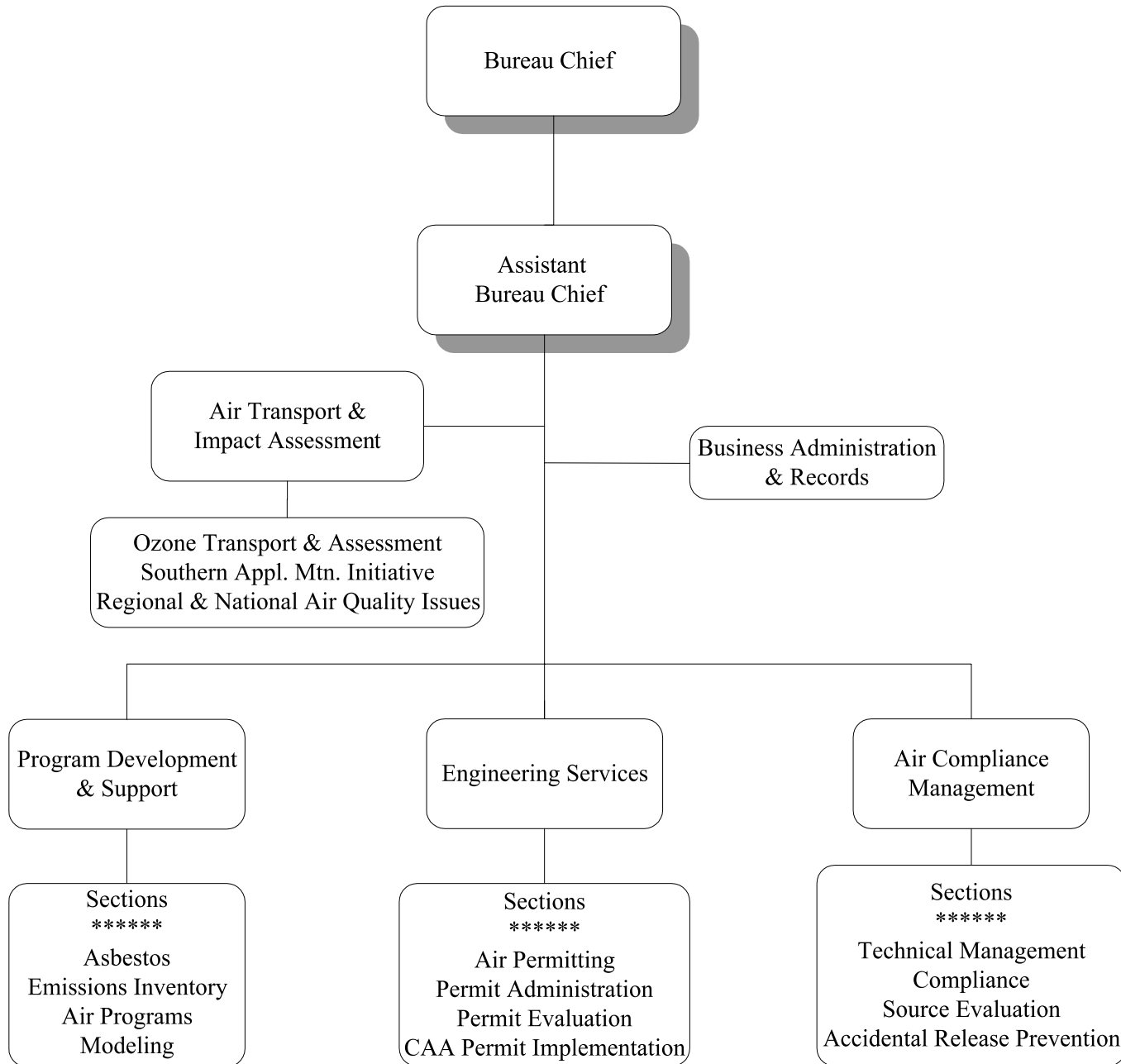
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S.C. DHEC
2600 Bull Street
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Organizational Charts



Bureau of Air Quality





Air Program Activities for 1997

Air Compliance Section

Notices of Violation Issued.....	524
Consent Orders Issued.....	99
Administrative Orders Issued.....	1
Civil Penalties Assessed.....	\$381,440

Technical Management Section

Annual Industry Inspections performed (all sources).....	961
Major Point Source Inspections (annual).....	640
NSPS Inspections (annual).....	103
NESHAP Inspections (annual).....	17
Total Complaints Investigated.....	1,741
Continuous Emission Monitor Inspections.....	140
Continuous Emissions Monitor Quarterly Reports.....	797
Continuous Monitor Excessive Emission Quarterly Reports.....	788

Source Evaluation Section

Source Tests Evaluated.....	319
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Asbestos Section

NESHAP Project Notifications.....	1,160
Non-NESHAP Project Notifications.....	2,385
Non-Inside-Containment Project Inspections Conducted.....	619
Inside-Containment Project Inspections Conducted.....	46
Abatement Licenses Issued.....	3,604
Complaints Investigated.....	120
Information Inquiries Addressed.....	8,000

Engineering Services Division

Total Construction and Operating Permits Issued.....	1611
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Environmental Quality Control, Division of Air Quality Analysis

Samples Received.....	6,070
Laboratory Analysis Performed.....	35,632

Chapter 1

AIR TRANSPORT & IMPACT ASSESSMENT

Since air has no real boundaries, air quality protection efforts are unique. Air quality in other states can influence the air in South Carolina. Unlike a stream with banks, a landfill with finite acreage, or a drinking water system with a service area, air quality (good or bad) will follow the prevailing winds. The concept of regional effects and transport has resulted in a number of regional and national initiatives to explore innovative and reasonable ways to improve air quality. Some examples are:

- Southeastern States Air Resource Managers (SESARM)
- Southern Appalachian Mountains Initiative (SAMI)
- Environmental Council of States (ECOS)
- Ozone Transport Assessment Group (OTAG)

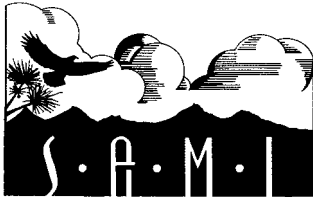
Recognizing that these groups are developing tomorrow's strategies and related resource needs, it was imperative that South Carolina and the Bureau of Air Quality (BAQ) fully participate in these efforts. For that reason, a separate group within the program was established to monitor and participate in these and other national and regional initiatives.

Southeastern States Air Resource Managers (SESARM)

SESARM is a regional effort to assess and promote air quality issues common to the states within the Environmental Protection Agency (EPA) Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee. Its stated purpose is to:

- Enhance communications and joint efforts among members, EPA, and other organizations involved or interested in effective air pollution management, especially as it affects the states in the southeastern region of the country;
- Improve the overall effectiveness of members in meeting national air quality goals and any related air quality goals specific to the southeastern region of the country or within a specific state of the southeastern region;
- Conduct, contract for, and facilitate research and training useful to meeting the purposes stated herein;
- Evaluate current and emerging air quality issues, develop a consensus to such issues among the members, and implement steps to resolve such air quality issues; and,
- Establish work groups and task forces to investigate specific air quality issues of concern to the members and recommend action to the members to improve and manage such problems, with special attention to issues which have regional implications or solutions.





R. Lewis Shaw, P.E., Deputy Commissioner, Environmental Quality Control, serves on the Governing Body of SAMI and is past Chairman of this organization.

James A. Joy III, P.E., Chief, Bureau of Air Quality, serves on the Operations Committee.

W. Phil Brantley, Director, Air Transport and Impact Assessment, is Chair of the Policy Committee.

Southern Appalachian Mountain Initiative (SAMI)

SAMI is a non-profit organization comprised of volunteers from Federal, State, and local agencies, industry, utilities, academia, environmental organizations, and other interested groups working together to find environmentally and economically sound solutions to air quality problems affecting the natural resources of the Southern Appalachian Mountains region. The eight states within the SAMI region are Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.

SAMI builds consensus and support for regional air quality management strategies that will protect the natural resources of the Southern Appalachians from the adverse effects of air pollution. SAMI studies are currently underway to characterize and assess visibility, ozone and acid deposition issues in the Southeast, particularly those in the Class I areas of the Southern Appalachian Mountains.

Environmental Council of States (ECOS)

ECOS is the national non-profit, non-partisan association of state and territorial environmental commissioners, established in December 1993. Membership includes representatives from all 50 states and all United States territories.

The mission of ECOS is to improve the environment of the United States by facilitating the exchange of ideas, views and experiences among the states; to foster cooperation and coordination in environmental management; and, to articulate state positions to Congress and EPA on environmental issues.

The major activities of ECOS involve the review and implementation of national environmental policy. For example, ECOS was a co-founder of the Ozone Transport Assessment Group (OTAG). Other activities created or sponsored by ECOS include the National Environmental Performance Partnership System, the Regulatory Innovation Workgroup, and the Core Performance Workgroup.

Ozone Transport Assessment Group (OTAG)

The OTAG process was the result of an agreement between EPA, ECOS and the National Governors Association (NGA). OTAG was a group of State and Federal regulators making policy recommendations after consultation with industry and environmental representatives. It was organized into three levels: the Policy Group (composed of ECOS Commissioners and EPA representatives), subgroups, and workgroups. Each group had a specific charge and mission. The goal of OTAG was to develop science-based recommendations for regional strategies to reduce levels of ground-level ozone and the pollutants that cause ozone. Specifically, OTAG's effort was to focus on necessary strategies for the Atlanta Metropolitan area, the Lake Michigan area, and the Northeast Corridor in order to demonstrate attainment with the one-hour ozone standard.

Ground-level ozone and its precursors are not always stagnant or stationary. All of these compounds can be carried by weather patterns from one area to another. Such movement is known as “ozone transport”. Areas downwind may be affected by emissions sources in another area or state. Therefore, the interstate and regional effects of ozone transport make it an issue that calls for cooperation between Federal, state, and regional authorities.

OTAG stakeholders recognized early the importance of its efforts in developing technically sound and credible data and information necessary for decisions. Through the significant contributions and accomplishments of staff participating in this effort, a database was created which provides a better understanding of the complex interactions of ozone, ozone precursors, and atmospheric science. This database was used to evaluate the impacts of ozone and possible solutions for the mitigation of these impacts.

In June 1997, OTAG presented its final report to EPA. OTAG’s recommendations included: technical analysis, major modeling/air quality conclusions, additional necessary modeling and air quality analysis, utility NO_x controls, non-utility point source control levels, national measures, low emission vehicles, cleaner gasoline and diesel fuel, vehicle emission inspection and maintenance controls, ozone action days, and a trading program framework.

Clean Air Act, Section 126 Petitions

The Clean Air Act allows states to petition the EPA Administrator to require another state to reduce emissions in order to address the transport of pollutants which they feel are impacting their ability to attain or maintain good air quality. If EPA finds in favor of the petition, within three months from the finding date, the sources identified must either shut down, comply with a specified emissions limit, or be on a Federal compliance schedule. Sources must be in final compliance no later than three years from the date of finding.

In August 1997, eight states (New Hampshire, New York, Massachusetts, Maine, Rhode Island, Vermont, Pennsylvania and Connecticut) filed petitions with EPA stating that sources in other states were interfering with their ability to attain the National Ambient Air Quality Standard (NAAQS) for ozone. Pennsylvania’s petition named South Carolina and 19 other states as contributing to its air quality problem. South Carolina does not believe it is impacting Pennsylvania’s compliance with the ozone standard.

On December 18, 1997, EPA and the petitioning states entered into a Memorandum of Agreement (MOA). This MOA provides for automatic remedy if the EPA Ozone Transport Rule fails to address transport issues. EPA will delay their decision on the petitions until the Ozone Transport Rule is final.



ECOS

R. Lewis Shaw, P.E., Deputy Commissioner, Environmental Quality Control, is the current Secretary-Treasurer for ECOS, a member of the Executive Committee and Chair of the Compliance Committee.

Ozone Transport Assessment Group

R. Lewis Shaw, P.E., Deputy Commissioner, Environmental Quality Control was a member of the Policy Group.

W. Phil Brantley, Director, Air Transport and Impact Assessment, was a member of the Modeling and Assessment Subgroup and the Strategies and Controls Subgroup.

Environmental Protection Agency NO_x SIP Call

In November 1997, referencing §110 of the Clean Air Act, the EPA proposed a rule requiring certain states to mitigate transport of ozone (smog) pollution and one of its main precursors—emissions of oxides of nitrogen (NO_x)—across state boundaries in the eastern half of the United States. This action proposes to find that the transport of ozone from South Carolina and 21 other states significantly contributes to nonattainment of the national ambient air quality standards for ozone, or interferes with maintenance of the standards, in downwind areas such as the Atlanta Metropolitan area, the Northeast Corridor, or the Lake Michigan area.

Recognizing the complexity of ozone and its transport, in November 1997, EPA issued its Finding of Significant Contribution and Rulemaking for Purposes of Reducing Regional Transport of Ozone. This Notice of Proposed Rulemaking (NPR) proposed that certain states submit planned measures to ensure that emissions reductions of NO_x are achieved as needed to preclude transport of ozone (smog) pollution across state boundaries. A Final Rule on this issue is expected in September 1998.

The Proposed Rule also established a NO_x emissions budget for South Carolina. This would require significant reduction of NO_x emissions. In order to meet this budget, EPA proposes that South Carolina will need to reduce utility source emissions by 85% and industrial source emissions by 70%, as well as to provide some reductions in mobile and off-road source emissions. South Carolina believes reductions in current emissions may be necessary to meet the 8-hour standard in the future. However, the amount and location of reductions needed will be determined by subregional air dispersion modeling.

EPA published a Supplemental Notice of Proposed Rulemaking on this issue in May 1998. South Carolina has submitted a final response to the proposed rule which stated in part, “South Carolina should not be included in EPA’s list of states found to be significantly contributing to ozone non-attainment problems.” The Final Rule is expected in Fall 1998. South Carolina intends to challenge any final rulemaking which results from this action.

Chapter 2

AIR COMPLIANCE MANAGEMENT

Air Compliance Section

The main objective of the Air Compliance Section is to facilitate the process of returning non-complying facilities, individuals, corporations and municipalities to compliance with Federal and State air quality regulations and permit requirements. To accomplish the objective, any one or combination of five mechanisms are utilized. These include the Notice of Non-compliance, the Notice of Violation, the Notice of Enforcement Conference, Consent Orders, and Administrative Orders. Figure 2-1 shows the actions that are taken when the Air Quality personnel find a violation.

A Notice of Non-compliance (NON) is a letter informing an entity that it has failed to comply with a Federal or State regulation, standard, rule, permit, or order. The NON is typically issued for first time minor violations. A Notice of Violation (NOV) is a formal document citing an entity for an alleged violation of State or Federal regulations, standards, rules, permits, orders, etc. of a more serious nature. Sometimes a NOV will not require any further action, or it may require a written response or the taking of some type of corrective action. A Notice of Enforcement Conference (NOEC) might also be issued along with a NOV. A NOEC is a formal document that cites an entity in more detail for alleged violations of a Federal or State regulation, standard, rule, permit, or order, and provides the entity with an opportunity to respond to the alleged violation(s). An Enforcement Conference is an informal meeting that affords the entity the opportunity to explain the alleged violation(s), and discuss any circumstances surrounding the violation(s) and any corrective action which may have already been taken or is proposed to return the entity to compliance. The entity has the right to be represented by legal counsel and technical consultants.

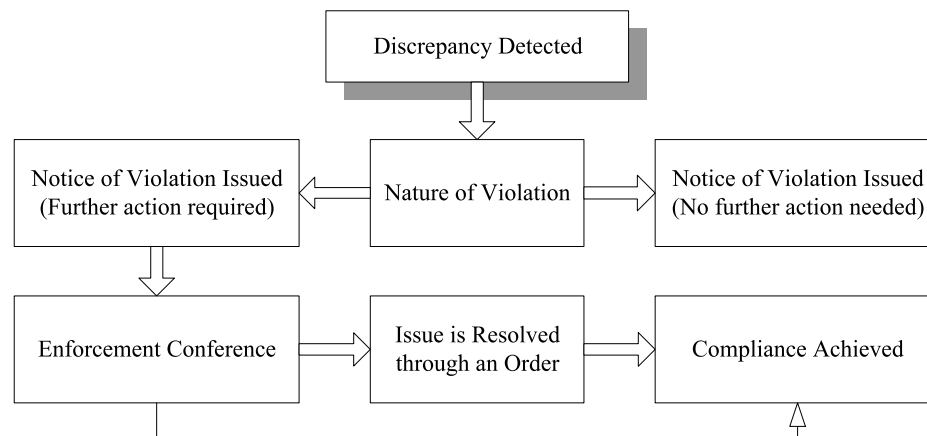


Figure 2-1: Compliance Violation Flow Chart

Top 12 Violations in Compliance Orders

Permit Requirements	40
Asbestos	38
Open burning	23
New Source Performance Standards	9
Previous Orders	7
Visible emissions	4
Toxic air pollutants	3
Prevention of Significant Deterioration	2
Fugitive particulate matter	1
Lowest Achievable Emissions Rate	1
Ambient Air Quality Standards	1
Periodic testing	1



If the Air Compliance Section determines that additional requirements and/or a civil penalty are warranted, a Consent Order or an Administrative Order may be issued to the entity. A Consent Order is a formal, legally enforceable document signed by both the entity and the Department of Health and Environmental Control (DHEC). The document states the alleged violation(s), specific conditions to be implemented to return the entity to compliance, and if appropriate, requirements for payment of a civil penalty. An Administrative Order is a legally enforceable document that is issued by DHEC when a matter cannot be resolved through mutual agreement. The Administrative Order is signed by DHEC only and directs an entity to complete specific requirements. Upon receiving an Administrative Order, the entity has fifteen (15) calendar days to appeal the Order. If appealed, the case is heard by an Administrative Law Judge (ALJ) who renders a decision. This decision may be appealed to the DHEC Board, and the decision of the DHEC Board may be appealed to the Circuit Court. If the Order is not appealed within fifteen (15) days, the Order stands as issued.

Air Quality program efforts can be measured in part by the regulated community's rate of compliance. The rate of compliance is calculated by dividing the number of orders by the number of major source facilities. The State's 1997 rate of compliance for Federal and State air requirements for major sources is 95.8%.

Source Evaluation Section

The primary duties of the Source Evaluation Section revolve around source testing. A source test is a method of measuring pollutants being emitted to the atmosphere from process or air pollution control equipment vents, ducts, or stacks. Source tests are conducted to measure emissions for such pollutants as particulate matter, trace metals, acids, and organic and toxic materials. Test results provide facility owners and operators with information on control device efficiency and data to be utilized in the design of new process and control equipment. Testing data is also utilized by the BAQ and the EPA to evaluate facility compliance and to formulate control strategies.

Prior to a source test being conducted, DHEC staff review and approve source test plans to ensure that the most appropriate test methods and procedures will be used for those pollutants being tested. Staff also go to facilities to observe source tests as they are conducted. Upon receipt of the source test report, personnel review the report, determine compliance, and prepare a summary. These results are also maintained in a database which is used to track and notify facilities of periodic retests.

The Source Evaluation Section is also involved with Continuous Emissions Monitoring (CEM). A CEM system monitors such pollutants as sulfur dioxide, nitrogen oxides, carbon dioxide, carbon monoxide, total reduced sulfur, oxygen, and opacity. The main functions of CEM systems are to determine emission compliance, identify periods of excess emissions, assess control equipment efficiency, monitor process parameters, and assist in maintaining plant safety. Personnel also observe CEM performance specification and audit tests, which are performed to ensure the CEM system is operating properly and review test reports. Title IV (Acid Rain) CEM audits are also performed by Source Evaluation personnel.

Technical Management Section

The Technical Management Section performs numerous review and data handling functions. Reports generated by the BAQ as a result of facility inspections, reports required by Federal and State regulations and standards, reports and plans required by permit conditions, and special studies results are reviewed for completeness and accuracy. Short term data coordination and long term trends analyses are performed for known or suspected problem areas and to predict areas of future concern. The Technical Management Section coordinates incinerator operator training, indoor air quality referrals, special studies, and District Liaison activities. EPCRA reporting of facility hazardous chemical inventory information and assistance in managing emergency conditions from potential site releases are also responsibilities of the Technical Management Section.

Accidental Release Prevention Program [Section 112(r) of the Clean Air Act]

On June 20, 1996, the EPA issued the Risk Management Program Rule under Section 112(r) of the Clean Air Act Amendments of 1990. The intent of this rule is to prevent accidental releases and reduce the severity of those releases that do occur. The rule applies to processes at facilities which use, store, handle, or manufacture substances on the 112(r) List of Regulated Substances in excess of a specified amount, or Threshold Quantity (TQ). The EPA published the 112(r) List of Regulated Substances on January 31, 1994 (See Appendix A, page 49). The list consists of 77 toxic and 63 flammable chemical substances that if accidentally released could cause adverse effects to human health and the environment. The TQs range from 500 to 20,000 pounds for each process. Facilities which have a TQ greater than one or more of the listed substances must develop and implement a Risk Management Program for the facility and submit a summary of the program elements, called a Risk Management Plan, to the EPA by June 21, 1999.

The Risk Management Program has three major components: hazard assessment, prevention, and emergency response. Under hazard assessment, facilities must evaluate the possible consequences of an accidental release to nearby communities, schools, hospitals, recreational facilities, and other public and environmentally sensitive areas by predicting worst-case and alternative (i.e., more likely) release scenarios. These scenarios can be demonstrated using computer-based models. Facilities must also document accidents that have occurred at the facility for the last five years. An integrated prevention program must be developed to include establishment of standard operating and safety procedures, proper training for employees, preventive maintenance procedures, investigation and documentation of accidents, and performance of periodic safety audits at the facility. Facilities must also develop an emergency response plan that outlines the procedures for informing the public and local responders of an accident and administering proper first aid and emergency medical treatment.

The BAQ is committed to implementing this regulation for all affected sources (approximately 900) in South Carolina. Chlorine, propane, and ammonia are the three listed substances for which most facilities will likely be covered. The BAQ has established an Accidental Release Prevention Program (ARPP) that provides outreach to industry by informing companies of the regulation and dates by which they must comply with this regulation.

For More Info...

If you have questions about the Risk Management Program, call:

Bureau of Air Quality

(803)734-4750

EPCRA Hotline

(800) 424-9346

More information on the Risk Management Program may be found on the Internet. The EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO) Homepage <http://www.epa.gov/swercepp/acc-pre.html>. The ENVIROFACTS address for viewing RMPs once they are submitted to the EPA starting in January 1999 is http://www.epa.gov/enviro/index_java.html.

Air Quality Complaints in 1997

Open Burning	960
Odor	360
Dust	218
Asbestos	75
Miscellaneous	65
Indoor air	63
Total	1,741

The BAQ has established a partnership with the Spartanburg Emergency Preparedness Department and Spartanburg LEPC to implement a project called the Spartanburg Accidental Release Prevention Awareness Project (SARPAP). The project focuses on implementing a community-based strategy for chemical accident prevention and awareness in Spartanburg communities. The project will take place over a three-year period and will involve distributing surveys, providing brochures, and conducting workshops and public forums. These outreach mechanisms will be used to generate information concerning the communities' perceptions of local industries, to educate residents and industry of accident prevention and emergency response planning, to promote better community-industry relationships, and to answer questions from the local community.

The BAQ also meets with industries and groups in the State in an effort to develop outreach opportunities. Different ideas are currently being discussed to increase awareness of the Risk Management Program. One idea under consideration is an Adopt-A-Facility Program where larger companies offer their resources and expertise to smaller companies when they are preparing their Risk Management Plans. Other ideas being considered include using display booths at community events and airing public service announcements on radio and television.

South Carolina is taking a leading role in the national implementation of the Risk Management Program. DHEC is represented on the National Risk Management Plan Implementation Workgroup, which is working to identify activities that must be undertaken and products that must be developed for facilities and government agencies to have the tools necessary to implement the Risk Management Program. The workgroup has seven subgroups addressing the following issues: Risk Communication, Guidance for Implementing Agencies, Guidance for Industry, Audit Protocol and Guidance, Electronic Submission, Outreach, Training, Program Evaluation, and the Role of LEPCs and Other Local Agencies. The workgroup also makes recommendations to the EPA about the best methods for carrying out these activities.

District Liaison

Environmental rules and regulations governing industry at the Federal and State levels are developed and expanded as we become more aware of the health and environmental concerns of industrial pollution. This growth in rules and regulations has caused a significant increase in the workload at both Federal and State levels. Included in this increased workload are in-depth air quality inspections. Consistency and accuracy are an integral part of any inspection program. With this in mind, the BAQ established a liaison function in 1992 to act as facilitator between the BAQ and the district air personnel statewide. The District Liaison position is charged with promoting consistency, accuracy, and completeness of district air personnel activities. Since the development of the liaison position in 1992 and because of the number of inspections that are necessary, a District Liaison Group has been established. The activities of the District Liaison Group include:

- Overseeing inspections and reviewing inspection reports.
- Ensuring that district air personnel are kept apprised of developments in regulations, permitting, source testing, asbestos, and compliance policies and requirements.
- Assuring that multi-media projects are properly coordinated and results are appropriately distributed.
- Ensuring a free flow of information regarding the BAQ and district-related projects and activities.
- Conducting evaluation inspections of district air personnel to ensure consistency in inspection techniques throughout the state.

Emergency Planning and Community Right-To-Know Act

There are four major parts involved in the Emergency Planning and Community Right-To-Know Act (EPCRA): Emergency Planning for Hazardous Substances, Reporting Chemical Accidents & Releases, Hazardous Substances Inventory & Community Right-to-Know, and Toxic Chemical Release Inventory.

Emergency Planning for Hazardous Substances (EPCRA §301/302/303) establishes state and local administrative units to oversee implementation of the Superfund Amendments and Reauthorization Act (SARA) Title III, and the reporting requirements for facilities and local emergency response plans. The law requires the governor of each state to appoint a State Emergency Response Commission (SERC) to manage the program. The SERC, in turn, appoints members to the Local Emergency Response Committees (LEPC), which implement EPCRA at the county level.

Reporting Chemical Accidents & Releases (EPCRA §304) requires all facilities to provide notification to the proper authorities of a release involving a Reportable Quantity (RQ) of any Extremely Hazardous Substance or any hazardous substance listed in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

Hazardous Substances Inventory & Community Right-to-Know (EPCRA §311/312) provides citizens and local agencies with information concerning potential chemical hazards in their communities. Also, facilities with the potential to expose employees to hazardous chemicals in the work place must report Communication Standards under EPCRA §311/312. EPCRA §311 stipulates that facilities must prepare, maintain, and report Material Safety Data Sheets (MSDS) for hazardous chemicals.

Toxic Chemical Release Inventory (EPCRA §313) requires facilities which provide MSDS information under EPCRA §311, to also submit a “Tier II” Form (Hazardous Chemicals Inventory) to the SERC, the LEPC, and local fire department, by March 1 of each year.





There are seven groups involved in EPCRA throughout South Carolina in addition to DHEC. They are:

- U.S. Environmental Protection Agency (EPA)
- State Emergency Response Commission (SERC)
- South Carolina Emergency Preparedness Division (SCEPD)
- Local Emergency Planning Committees (LEPC) with the support from County Emergency Preparedness Departments (EPD)
- Local Fire Departments
- Facilities: Industry, businesses, government agencies, publicly/privately owned facilities, warehouses, etc.
- Citizens

DHEC receives §302, 304, 311, 312, and 313 reports and notifications, provides technical support to the SERC, LEPCs, and facilities, and maintains databases of SARA Title III information for use by LEPCs and the public. The BAQ maintains files of §302 reporting, receives notification of chemical accidents, spills and releases and, receives and maintains Tier II Chemical Inventory Forms, MSDS lists, and Toxic Chemical Release forms.

In order to make hazardous chemicals inventory information accessible and useful to the public and especially to the emergency response community of local authorities and responders, the data is compiled into CAMEO® (Computer Aided Management of Emergency Operations). CAMEO® combines chemicals lists with facility-reported information on types, hazards, amounts and locations of hazardous chemicals. Electronic reporting software is available for download from the World Wide Web. Tier II WIN™ is a free software application for use with Windows® that produces an electronic or printed Tier II form. The EPCRA reporting coordinator at DHEC provides phone and e-mail support to reporting facilities. Related activities include training for responders and local officials using CAMEO®, Area Location of Hazardous Atmospheres (ALOHA®), Mapping Application for Response, Planning, and Local Operational Tasks (MARPLOT®) mapping software to display CAMEO® and ALOHA® information graphically and Tier II WIN™ reporting software.

Citizens may request copies of specific emergency response plans, MSDSs, MSDS lists, inventory forms, and toxic chemical release forms. They may also follow up emergency notices, with some exceptions for trade secrets, and may initiate legal actions against facilities for violations, under certain conditions.

Chapter 3

PROGRAM DEVELOPMENT & SUPPORT

Air Programs Section

The Air Programs Section is charged with a wide variety of duties, most of which involve providing customer service to both internal and external customers. The Air Programs Section's primary responsibilities are developing regulations to maintain consistency with federal requirements, developing and amending state-specific regulations, and maintaining the Air Quality State Implementation Plan (SIP); providing outreach to schools and the public about general air quality issues and how cars, trucks and other transportation-related issues affect air quality; providing information to the public through Community Right-To-Know, the Toxic Release Inventory, Key Identifier and pollution prevention efforts; coordinating training activities for air program personnel to ensure that each person has the necessary training; compiling air program information and contributing to or producing reports such as the *South Carolina Air Quality Annual Report*, *The Quality of the Environment in South Carolina*, and the *Department of Health and Environmental Control Annual Report*; ensuring that the Bureau of Air Quality (BAQ) satisfies Federal grant requirements; and, providing information technology support via network administration, computer hardware and software maintenance and support, computer programming and support for internal and external informations systems.

Community Right-to-Know

Community Right-to-Know responsibilities moved to the BAQ as part of the relocation of the Title III functions of the Superfund Amendments and Reauthorization Act (SARA). Community Right-to-Know responsibilities include facilitating citizen involvement in agency programs, supporting integration of environmental data collections, and managing the State's Toxic Release Inventory (TRI).

The TRI is a database that provides communities with information on releases to the air, water, and land for approximately 700 substances that are commonly used by manufacturers. A facility that uses any listed toxic chemicals must provide a detailed accounting of the chemical's usage, the chemical's purpose, releases to the environment on-site, transfers to other facilities as waste, waste treatment on-site, two-year projections of the same criteria, and progress in reducing the use of that chemical over previous years. With this information, communities can better understand the nature of toxic releases at the local level, assess risk, and make informed decisions about local priorities.

The BAQ provides guidance to reporting facilities and collects TRI information annually. The data is then made available to the public in a variety of formats. Shortening the delay in data turnaround remains a long-term objective. This entails prevailing upon the approximately 500 TRI facilities to submit their reports electronically. Currently, 80% of South Carolina facilities submit their reports electronically.



Mobile Source Facts...

A well maintained 10 year old car will emit more pollution than a poorly maintained 5 year old car.

Carpooling is a great way to reduce air pollution.

TRI Statistics...

The TRI tracks industry's progress toward reducing waste generated from the use of listed toxic chemicals. South Carolina's TRI for 1996 shows a 20% reduction in releases to the environment from 1995 figures, and a 32% reduction in off-site transfers.

On-site Releases

Type	Quantity(lbs)
Stack air	32,841,520
Fugitive air	7,586,150
Surface water	2,058,181
Land	679,904
Total	43,165,755

Off-site Transfers

Category	Quantity(lbs)
Recycling	60,582,429
Disposal	6,842,382
Energy recovery	5,718,995
Treatment	5,715,927
Publicly owned treatment works	4,045,844
Total	82,905,577

The TRI is currently the only pollution report that must be made publicly available, and it draws widespread attention as an indicator of pollution trends. More recently, it has become the focus of a federal effort that seeks to link the nation's TRI with the data routinely maintained in air, water and waste programs. An integral part of this effort is assigning each facility site a unique number, a "key identifier". In addition to supporting a range of regulatory applications, the Environmental Protection Agency (EPA) intends to utilize this system to enable the public access to a given facility's complete set of compliance reporting. Recognizing the need to establish precedent for a State "key identifier" model, an effort has begun to link, at the facility level, all of the environmental compliance reports collected by the Department of Health and Environmental Control (DHEC).

In addition to needing information, citizens occasionally require guidance in presenting their concerns to DHEC or in participating in the regulatory process. Current work with industry and communities in the Charleston Community-Based Environmental Protection (CCBEP) project reveals the complications incurred when the environmental quality of long-standing neighborhoods has gradually eroded by lack of adequate planning with regard to industrial development. The CCBEP will attempt to improve the total environment that citizens live in, including their physical health and well being, as well as the social, economic, and environmental health of their surroundings. The overall goal of the CCBEP Work Plan is to focus on environmental or non-compliance problems associated with the Charleston/North Charleston area. Both DHEC and the EPA see their roles as one of support to the overall mission of the project, with an emphasis on improving the environment of the area. With the Charleston project in mind, a mentoring program with Benedict College's Environmental Science Department has been started. Four student interns have been selected to examine the permitting process; the issues of land-use planning, the industrial point of view, and grass-roots issues.

At the national level, the BAQ Community-Right-to-Know personnel participate in three forums comprised of other states and EPA program directors for the TRI, Key Identification Initiative, and Community-Based Environmental Protection. These groups have provided many valuable opportunities to represent South Carolina interests in developing national implementation.

Geographic Information Systems (GIS)

The use of GIS to display environmental and demographic information in graphical form fosters better decision making and a more informed public. For this reason, the BAQ has begun activities to establish a GIS. Map layers in progress are state-wide air monitoring stations and air regulated facilities. Locations are being established using global positioning systems with an accuracy of one to three meters. These data sets, additional environmental map layers, census data layers, and infrastructure map layers are available to the public through the Environmental Quality Control (EQC) Information Technology Section. This information is available on CD-ROM and has a Data Dictionary with detailed explanations of the various map layers included, the development standards utilized, and points of contact should there be questions or comments. Future plans for the agency's GIS effort are to supply these and other mapping products via CD-ROM and through the World Wide Web.

Mobile Sources

Although time and resources are spent on regulating and permitting stationary sources in South Carolina, roughly half of all man-made air pollutants do not come from power plants, pulp and paper mills, or chemical plants. The emissions from cars, trucks, and other off-road vehicles are large sources of volatile organic compounds (hydrocarbons), nitrogen dioxide, fine particulates, and carbon monoxide. They are also a major source of carbon dioxide, which is a greenhouse gas.

The Clean Air Act targets automobiles as well as industry, but the regulations aimed at reducing mobile source emissions were enacted on a national level and dealt specifically with the manufacturing of new automobiles. That approach has been very effective in making new cars much cleaner. As a result, the emissions from automobiles has been reduced over 90% from the cars made in 1970. The switch to unleaded gasoline is another example of a national program that has made a huge reduction in the amount of pollution our cars make. However, much of this improvement has been offset by the fact that we drive many more miles today than we did in 1970.

Because of the changes mandated by the Clean Air Act, its amendments, and state-specific regulations, South Carolina's air quality has been meeting all of the national air quality standards for many years. However, in July of 1997, the EPA made the air quality standards more stringent. South Carolina, like most of the nation, will have difficulty meeting those new standards. To meet the new standards, we may have to look for ways of reducing the emissions from mobile sources.

Currently a proactive, non-regulatory effort is being studied to help South Carolina meet the new air quality standards. This joint effort between the BAQ, industry, and health and environmental interest groups will sponsor a public information campaign about ways that individuals can reduce air pollution voluntarily. It will also forecast specific days that are likely to have poor air quality and ask citizens to postpone or minimize pollution generating activities until conditions have improved. Some of the recommended techniques include carpooling, combining car trips, and mowing the lawn on the next low pollution day.

What is certain is that the air pollution from mobile sources in South Carolina has not been fully addressed. With the tougher new air quality standards, we must do more. The health and welfare of our state depend on it.

Public Outreach

The BAQ outreach program assists in the conservation and enhancement of air resources while promoting quality of life. This is accomplished by increasing public understanding of the importance of protecting South Carolina's air resources. To keep the public informed and to increase public awareness on air quality issues, the BAQ works with public interest groups by participating in seminars, workshops and conferences. The outreach program also pursues



Mobile Source Facts...

Americans drive an astounding 6.3 billion miles every single day, compared to 2.4 billion in 1965.

Transportation sources contribute more than 50% of the total amount of man-made air pollution in South Carolina.

Mobile Source Facts...

Each gallon of spilled or evaporated gas puts as much hydrocarbon in the air as 7,500 miles worth out the tailpipe of a car.



When functioning properly, catalytic converters and electronic engine systems can reduce harmful emissions by up to 90%.

opportunities to obtain funding through grants for expanding outreach efforts. To increase the base of support for understanding that South Carolina has clean air and must protect its air resources, partnerships with key groups (e.g., American Lung Association, South Carolina Petroleum Council, Department of Transportation, South Carolina Educational Television Network, South Carolina State Library) have been established.

Other outreach efforts include public meetings that are held throughout the state. In 1997, BAQ held meetings to provide opportunities for the public to hear about the proposed national ambient air quality standards for ozone and particulate matter. Also, the BAQ's Outreach Coordinator has been trained to use the Air & Waste Management Association Environmental Resource Guide for Air Quality. Personnel receiving this training instruct South Carolina teachers on how to use the guide as part of their classroom instruction. BAQ personnel are also available for public speaking, educational seminars, and radio and television interviews for air-related topics. A listing of outreach materials and guidance documents can be found in Appendix B.

Regulations

The Air Programs Section develops and revises air quality regulations and standards in South Carolina. In order to determine what regulations need to be developed or revised, staff members track the development of federal standards that may effect the Air Quality Program. If these federal standards are found to impact the South Carolina Air Quality program, staff ensure that an appropriate state regulation is updated or developed to remain consistent with the federal rule. In addition, staff remain in contact with other sections within the BAQ to ensure that necessary state-specific regulations are developed or revised in a timely manner. The development and revision of any air quality regulation is performed under the guidelines set forth by DHEC and the requirements of the S.C. Administrative Procedures Act (APA).

In order for a new or revised state regulation to be legally applicable in South Carolina, it must be developed following the APA. The APA ensures the public and regulated community are informed and aware of the proposed regulation and given an opportunity to participate in the development process. The APA requires DHEC to provide public notice of a change in an existing regulation or development of a new regulation on three different occasions. The APA also requires a minimum of two 30-day comment periods whereby interested parties may voice their views and provide insight into the appropriateness of the proposed standard. The APA requires that DHEC consider all comments prior to the development or revision of a regulation. In addition, the APA requires legislative review of standards that are state-specific or are more stringent than federal standards.

In the upcoming year, it is projected as many as 17 new or revised regulation activities will be undertaken. Because of the requirements of the APA and DHEC's commitment to provide customer service to the citizens of South Carolina, comments are encouraged during the regulation development process. If you are interested in receiving information concerning proposed revisions to the South Carolina Air Quality Regulations and Standards and would like to be included on our mailing list, please write to **DHEC - Bureau of Air Quality, Air Programs Section, 2600 Bull Street, Columbia, SC 29201.**

Authority of the BAQ

The Pollution Control Act (South Carolina Code of Laws, 1976, as amended, Title 48 Chapter 1), South Carolina Regulation 61-62 (Air Pollution Control Regulations and Standards), South Carolina Regulation 61-86.1 (Standards of Performance for Asbestos Projects), the Asbestos Abatement License Act (1976 South Carolina Code of Laws, §44-87-10), to the extent that the law provides a role for states, the Federal Toxic Substance Control Act (15 U.S.C. §2646, Asbestos), and the Clean Air Act (42 U.S.C. §7401 et seq.) are the enabling legislation that provides the foundation for the BAQ. Approval to administer federal air quality regulations in the State has been delegated to South Carolina by the EPA. Attached, as Appendix C, is the South Carolina Delegation and Promulgation of Authority for federal standards. The BAQ is committed to cooperating fully in all efforts to address pollution both locally and nationally, as well as informing the public and helping industry to understand and comply with new regulations.

State Implementation Plan (SIP)

The purpose of the South Carolina Air Quality Implementation Plan is to provide for the implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS), which have been promulgated by the EPA. These objectives are carried out by the formulation of control strategies and the promulgation of regulations to control or limit emissions to the ambient air.

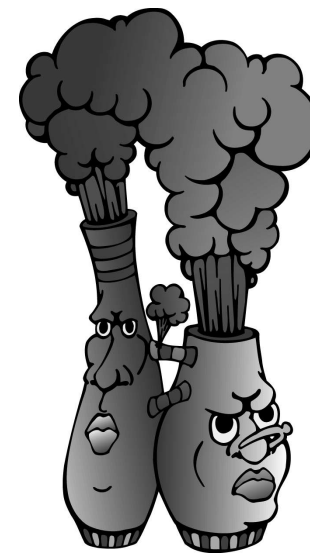
The SIP was first approved in May 1972 and has been continually revised to adapt to new information. The majority of the revisions and additions are to incorporate regulations, which form the basis for air emissions control and enforcement.

The following SIP revisions were acted on in 1997:

1. The EPA published a direct final rule in the Federal Register on December 19, 1995, [60 FR 65382] for Municipal Waste Combustors, to amend Subpart Ea of the New Source Performance Standards (NSPS) and to make Subpart Ea consistent with Subparts Eb and Cb. States were required to adopt or develop a Municipal Waste Combustors regulation that is consistent with, and at least as stringent as, the EPA regulation. DHEC adopted the federal requirements for Subpart Ea, Municipal Waste Combustors into R.61-62, Air Pollution Control Regulations and Standards. This regulation became effective with its publication in the State Register on December 26, 1997.
2. DHEC requested delegation from the EPA by letter dated October 17, 1997, for the following Standards:
 - a) Revised New Sources Performance Standards for the Phosphate Fertilizer Industry: Granular Triple Superphosphate Storage Facilities [40 CFR Part 60 Subpart X; April 15, 1997, Volume 62, Number 72];
 - b) Revised New Sources Performance Standards for Nonmetallic Mineral Processing Plants [40 CFR Part 60 Subpart OOO; June 9, 1997, Volume 62, Number 112]; and,
 - c) Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Hospital/Medical/Infectious Waste Incinerators [40 CFR Part 60 Subpart Ec and Ce; September 15, 1997, Volume 62, Number 178].



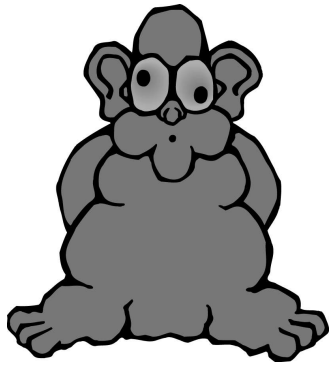
Carbon Monoxide



**Nitrogen Dioxide &
Sulfur Dioxide**



Toxic Air Pollutants



Lead

Additional Regulatory Developments

The SIP does not incorporate all air regulations imposed on states by the EPA or the Clean Air Act Amendments of 1990. The following non-SIP revisions were acted on in 1997:

1. Regulation 61-62.1, Section IV, Source Tests, was drafted as a new regulation. The regulation requires sources to submit site-specific test plans for review and approval before conducting tests. Prior to Regulation 61-62.1, Section IV, Source Tests, there were no regulations to govern site-specific source test plans. As a result, many source test requirements were implemented through the DHEC-issued guidance and policy. The Source Tests regulation establishes, clarifies, and standardizes testing requirements for source owners, operators, and testers. The regulation standardizes the existing source test requirements in Regulation 61-62.5, and will require affected sources to develop site-specific test plans to be submitted to DHEC for approval prior to conducting source tests. Requirements for a site-specific test plan will include the following information: a discussion of test objectives, accessibility and representativeness of sampling locations, process descriptions, sampling and analytical procedures, internal quality assurance/quality control methods, data reduction and reporting procedures, and safety considerations. The site-specific test plan will help DHEC ensure that prescribed and approved test methods are used during source tests. The draft regulation was approved by DHEC Board on December 11, 1997 and was published in the State Register on June 26, 1998.
2. Regulation 61-62.5, Standard No. 8, Toxic Air Pollutants, was revised as a direct result of the regulation reform effort that began in 1995. In October of 1995, BAQ management met with representatives from the S.C. Chamber of Commerce and other organizations to discuss the concerns of various air quality regulations. One of these regulations was Standard No. 8, Toxic Air Pollutants. It was felt that an amendment to the regulation was needed to clarify requirements to all affected source owners and operators. This revision provides clarification to whether a facility is required only to submit emissions data or to perform air dispersion modeling, and clarifies the circumstances when DHEC will perform modeling for the facility. It provides updated information on modeling requirements for facilities, as well as information for modeling assistance from DHEC to small businesses. Certain chemicals have been shifted to different toxicity categories or removed from the list. The structure of the tables containing the chemicals were revised to make the tables easier to read, and names and Chemical Abstract Services (CAS) numbers for certain chemicals contained in the standard were clarified. This should help reduce the amount of time spent determining which chemicals are subject to the standard. Providing common alternative names for certain chemicals should also reduce the amount of time spent determining which chemicals are subject to the standard. The amendment provides relief to facilities that emit chemicals subject to the Federal Maximum Achievable Control Technology (MACT) standards as specified in Section 112 of the Clean Air Act Amendments of 1990. These Federal standards will require affected facilities to institute controls on processes emitting hazardous air pollutants. The Federal standards will be more stringent than Standard No. 8 as compliance with Standard No. 8 may be achieved without necessarily installing control technology. The revised regulation was approved by the DHEC Board on December 11, 1997 and was published in the State Register on June 26, 1998.

3. The EPA published a final rule in the Federal Register on December 19, 1996 [61 FR 67113] revising 40 CFR Part 76, Acid Rain Program; Nitrogen Oxides Emissions Reduction Program. The EPA revised the federal regulation by establishing nitrogen oxides emission limitations on certain coal-fired electric utility units as identified in Section 407(b)(2) of the Clean Air Act Amendments of 1990. DHEC amended Regulation 61-62.72, Acid Rain, to incorporate requirements for the provisions contained in Part 76 and for consistency with the Federal regulation. This revision became effective upon publication in the State Register on November 28, 1997.
4. Asbestos Regulation 61-86.1, Standards of Performance for Asbestos Projects was legislatively approved and became effective by publication in the State Register as Document No. 1914, Volume 20, Issue 6, on June 28, 1996. During the implementation of this regulation, the staff and regulated community identified a need for further clarification of some of the rules. DHEC amended the regulation to clarify when an asbestos project license must be obtained, who can hire the project air sampler, who has to inspect an abated area prior to final air clearance, when notification for small projects must be made, when asbestos waste can be stored on a quarterly basis, and to correct a reference omission. The amended rule was published in the State Register on May 22, 1998.

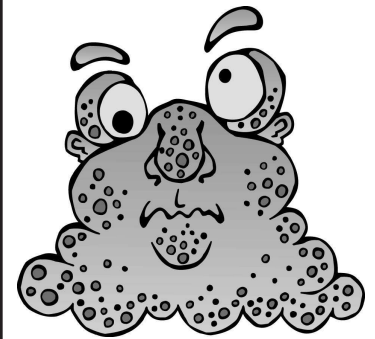
Ozone & Particulate Matter National Ambient Air Quality Standards (NAAQS)

The NAAQS set national goals for acceptable concentrations of specific pollutants in outdoor air that threaten public health and the environment across broad regions of the country and are emitted in relatively large quantities by a variety of sources.

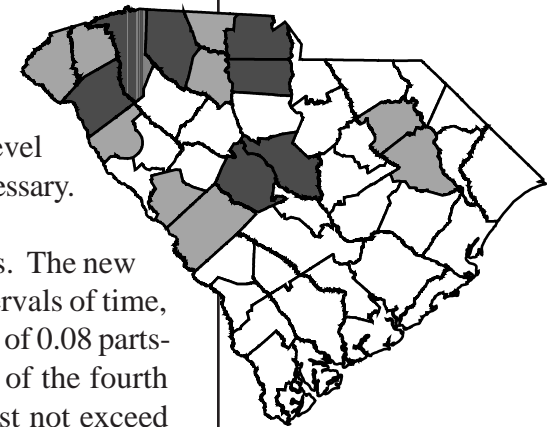
The EPA develops two standards for each pollutant. A primary standard is established to protect public health and a secondary standard is established to protect public welfare. The Clean Air Act requires the EPA to review these standards at least every five years. EPA recently reviewed the standards for ground-level ozone and particulate matter and determined, based on current scientific information, that revisions were necessary.

On July 18, 1997, the EPA published revisions to the ground-level ozone and particulate matter standards. The new primary standard for ground-level ozone is based on averaging air quality measurements over 8-hour intervals of time, instead of the previous 1-hour measurement. Along with the 8-hour standard, the EPA has adopted a level of 0.08 parts-per-million (ppm). The previous level was 0.12 ppm. To attain the new standard, the 3-year average of the fourth highest daily maximum eight-hour average of continuous ambient monitoring data over each year must not exceed 0.085 ppm.

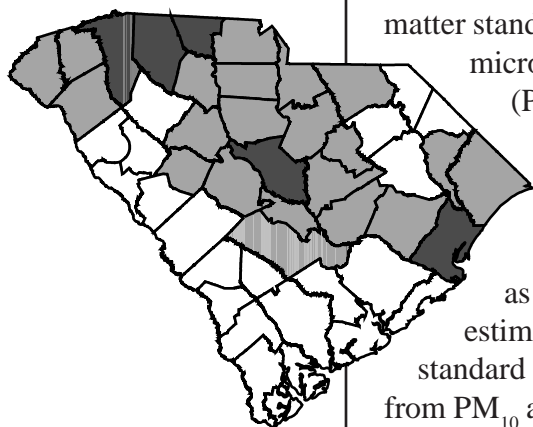
Figure 3-1 shows that South Carolina has several areas that may be impacted (dark gray) by these new standards as well as areas of concern (light gray). The monitoring data from 1993-1997 indicates that ozone concentrations in the urban areas of Greenville-Spartanburg-Anderson, Columbia-Lexington, Rock Hill, Aiken and Florence may approach or exceed the new standard. Monitoring data from 1997, 1998 and 1999 will be used to determine compliance with the new ozone standard.



Ozone



**Figure 3-1:
Ozone Potential
Impacts**



**Figure 3-2:
Particulate Matter
Potential Impacts**



Particulate Matter

On the same day the new ground-level ozone standard was established, the EPA published final revisions to the particulate matter standard. The previous standards addressed particles up to 10 microns (PM_{10}) in diameter (A human hair is 70 microns in diameter). Based on review of available scientific data, the EPA determined that it is the fine particles ($PM_{2.5}$), those less than 2.5 microns in diameter, which are of the greatest health concern. The EPA issued final revisions to strengthen the particulate matter standards by keeping the PM_{10} standards and adding standards for $PM_{2.5}$.

The new standard for $PM_{2.5}$ creates a bigger challenge to identify areas of impact. South Carolina, as well as the rest of the nation has no long term monitoring database for $PM_{2.5}$. The EPA determined, using an estimate of the percentage of PM_{10} that was $PM_{2.5}$, there would be no areas in South Carolina impacted by the new standard for $PM_{2.5}$. However, limited data collected in several rural and urban areas, along with estimates derived from PM_{10} and TSP sampling around the State, indicates (Figure 3-2) that many areas of South Carolina may exceed (dark gray) or have the potential to exceed (light gray), the new annual standard for $PM_{2.5}$. States will collect three years of monitoring data beginning in 1998 and will make attainment demonstrations beginning in 2002.

Training

The Air Programs Section coordinates efforts to identify the training needs and expectations for each position and area of service within the BAQ as well as other groups. To accomplish this, the BAQ uses the products and services provided by the EPA Air Pollution Training Institute. Some of these products and services include Area Training Centers, the Air Pollution Distance Learning Network, and other EPA granted Air Pollution Control Training providers which enable BAQ personnel to keep abreast of new programs and initiatives and to help satisfy training needs.

The BAQ has made available to the public, access to nationally broadcast programs on the Air Pollution Distance Learning Network. The schedule of telecourses and workshops which are offered free to the public, can be found on the BAQ Home Page. To attend any telecourses or workshops, contact the Site Coordinator listed on the web page.

The BAQ hosts Visible Emissions Evaluation (VEE) Classroom Lecture and Field Certification Programs every six months. Air program inspectors are required to maintain VEE Certification in order to conduct observations of stationary source visible emissions to determine compliance with opacity standards. Two "Smoke Schools" are conducted between March 1 and May 31 and two more, six months later, between September 1 and November 30. Through a cooperative agreement, EI duPont has two additional smoke schools each year to help provide training to the regulated community.

Asbestos Section

The EPA has categorized asbestos as a hazardous air pollutant under the National Emission Standards for Hazardous Air Pollutants (NESHAP). The Asbestos Section carries out the routine oversight and inspection of state-wide activities

involving renovation and demolition to regulated facilities. Primary responsibilities include responding to renovation and demolition project notification, licensing asbestos abatement personnel, responding to customer inquiries, conducting training, and auditing asbestos training courses and training providers for content and quality.

More than 4,000 projects are reported annually to the BAQ. Although there is an established reporting time for most projects, after the internal review process, inspectors are often left with only two days to inspect the projects and to make a compliance determination. Most projects are revised at least once, which routinely doubles the administrative workload.

More than 3000 licenses are issued annually in 14 disciplines. The disciplines include:

- | | |
|---|--------------------------------|
| • Contractor | • Worker (AHERA) |
| • Air Sampler | • O&M Worker |
| • Consultant | • Worker (Roofer) |
| • Consultant/Building Inspector | • Supervisor (Roofer) |
| • Consultant/Management Planner | • Consultant/Roofing Inspector |
| • Consultant/Project Designer | • Group |
| • Supervisor [Asbestos Hazardous
Emergency Response Act (AHERA)] | • Facility O&M |

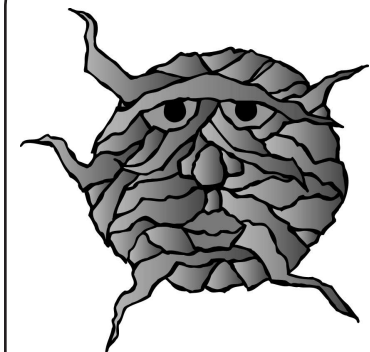
A license allows individuals to perform asbestos related activities after having received adequate training and instruction. Additionally, this Section responds to an average of 10,000 inquiries from concerned citizens on an annual basis.

The Asbestos Section fosters compliance assistance and outreach activities by:

- Creating and distributing documents, which provide updates on state-of-the-art procedures in the asbestos industry. These documents can be found on the World Wide Web at http://www.state.sc.us/dhec/asb_home.htm.
- Presentations to trade groups and other organizations.
- Initiating group meetings to encourage compliance.
- Organizing meetings and other group forums as necessary to assist the regulated community with regulatory interpretations.
- Establishing and maintaining reciprocity with the EPA Region IV states and other states to promote national consistency within the industry.

Emission Inventory Section

The Emission Inventory Section is responsible for estimating the actual amounts of various pollutants emitted to the air. A traditional emissions inventory produces annual estimates of carbon monoxide (CO), nitrogen oxides (NO_x), particulates,



Asbestos

Demolitions...

Demolitions are regulated by DHEC and the EPA.

An inspection for asbestos is required prior to demolition.

DHEC has to be notified of a demolition at least 10 working days prior to starting.

* Many residential demolitions are exempt.

Emissions Statistics...

These numbers represent the actual emissions from the 524 Major Point Sources in South Carolina for the 1995 calendar year.

Pollutant	Quantity(tons)
CO	61,262.35
NO _x	140,841.55
TSP	27,130.14
SO _x	228,645.12
VOC	39,173.00
Total	497,052.16

respirable particulates (PM₁₀), sulfur oxides (SO_x), and volatile organic compounds (VOCs). These estimates are usually in tons per year. In addition to traditional emission inventories, non-attainment area and Toxic Air Pollutant (TAP) inventories are also produced.

Efforts are primarily focused on Major Point Sources, which are those facilities that have actual or potential emissions great enough to warrant routine calculation of their annual emissions. Information to make these estimates is collected every two years. EPA approved methodology and preferred methods are utilized to make these estimates. DHEC actively participates in the National Emission Inventory Improvement Program (EIIP) and incorporates all EIIP Preferred Methods Documents by reference into the BAQ operating procedures.

Section personnel prepare statewide inventories of Area Sources (categories of sources, such as gasoline station emissions, which are individually small but collectively emit significant amounts of pollution), Mobile Sources (automobiles, trucks, etc), and Biogenic Sources (forests, crop lands, etc). These inventories will allow better assessment of areas where reduction of emissions will help maintain compliance with the NAAQS.

Air permit fees are charged annually to each facility that has or should have an air permit. State Regulation 61-30 requires that air permit fees be based on actual emissions. Industry personnel are provided the opportunity to review DHEC calculations prior to invoicing. Emissions for 1995 have served as the basis for permit fees for the past two State Fiscal Years (July 1 to June 30) and will remain the fee basis for the immediate future.

South Carolina performs emission estimation calculations placing a smaller reporting burden on industry and ensuring consistent methodology. To ease the reporting burden on industry while collecting the highest quality information from Point Sources, the 1997 emission inventory was sent electronically for the first time. The electronic media contained information specific to each Major facility in the State.

Development and implementation of new electronic data exchange software will allow the Emissions Inventory Section to meet the increased reporting challenge posed by the new NAAQS for ozone and fine particulates (PM_{2.5}). In addition to using this application software with industry, the section is also actively facing the challenge of incorporating data into DHEC's new Environmental Facilities Information System as well as interfacing with EPA data bases which are currently undergoing major reengineering. The Section is expected and intends to do much more with less using the new electronic tools available as well as continuously reviewing its processes to ensure the highest levels of productivity and quality.

Air Modeling Section

The Air Modeling Section provides support to the Compliance and Permitting Sections through the review of air dispersion modeling analyses. These analyses may be submitted in support of construction permit applications, operating permit renewal applications, Title V major and Title V conditional major permit applications, and compliance demonstrations. These analyses are done to show attainment with one or more of the following regulations:

1. South Carolina Ambient Air Quality Standards (SC Regulation 61-62.5, Standard No. 2)
2. South Carolina Air Toxic Standard (SC Regulation 61-62.5, Standard No. 8)
3. Ambient Air Limits for Prevention of Significant Deterioration (SC Regulation 61-62.5, Standard No. 7).

This Section also develops and performs modeling analyses for businesses classified as a “small business stationary source” as defined in the Clean Air Act (42 U.S.C. §507 (c)) and for businesses that show modeling requirements will cause an excessive financial hardship on them. In addition, personnel perform research and provide guidance on climatology issues, Class I area impact issues, and any impacts to South Carolina due to changes in the NAAQS.

The Section is currently preparing a revision to the August 1993 version of the Air Quality Modeling Guidelines. The revised version will include the October 1996 revision to the Air Toxic Modeling Procedures, update the document to refer to the latest EPA-approved air dispersion models, and include the latest procedures for use in air dispersion modeling.

Leak Detection and Repair Program

The South Carolina Leak Detection and Repair (LDAR) Program was started in 1994 to assist companies in their effort to demonstrate compliance with the State Toxic Air Pollutant Standards (Standard 8). The LDAR Program allows companies, prior to permitting, to demonstrate compliance with Standard 8 by inspections instead of air dispersion modeling. Implementing a LDAR Program means visually inspecting sources for cracks or other signs of leakage once a month, and by conducting quarterly monitoring of each source. Sources which can be included in the LDAR Program include pumps, compressors, pressure relief devices, sampling connector systems, open-ended valves, and any line, flange or connector that contacts a solution that is at least 10% by weight of one or a combination of those air toxics listed in Standard 8. Participation in the program is voluntary, but companies must meet certain criteria before acceptance into the LDAR Program.

Class I Areas

Class I areas are parks and wilderness areas designated by the U.S. Congress in 1977 to preserve environments that are relatively pristine. Industries locating within 62 miles (100km) of these areas are required to meet very strict federal standards for pollution control. Cape Romain is the only Class I area in South Carolina.

The Cape Romain National Wildlife Refuge area is located in Charleston County, just east of the Intracoastal Waterway between Charleston and Georgetown, and is classified by EPA as a Federal Class I area (Figure 3-3, page 30). Since 1983, South Carolina has been monitoring this area to determine what changes are occurring, if any, as a result of man-made pollution. The data will be used to assess the effect of pollution on visibility in the area. New facilities with sulfur dioxide emissions (e.g. power plants) find it difficult to locate near Charleston or Georgetown because of the Cape Romain Class I area. More than 94 percent of the allowable Class I level for sulfur dioxide has been used.

Modeling...

For modeling purposes, use the following concentration values in determining background concentrations:

Total Suspended Particulates

Annual: Geometric Mean

Particulate Matter 10

Annual: Arithmetic Mean
24 Hour: 2nd Max Value

Sulfur Dioxide

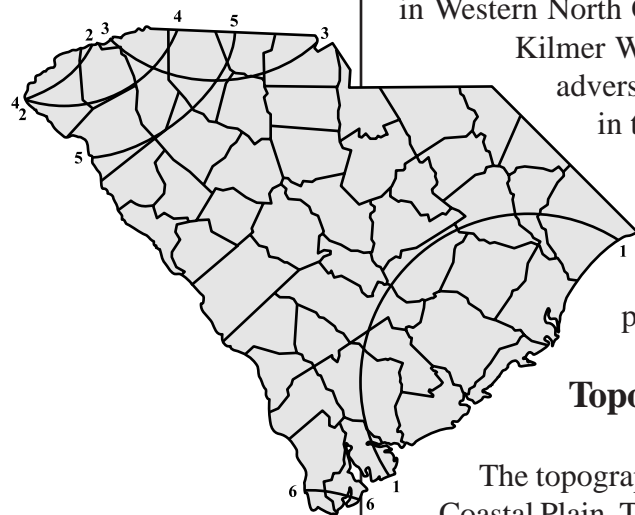
Annual: Arithmetic Mean
24 Hour: 2nd Max Value
3 Hour: 2nd Max Value

Nitrogen Dioxide

Annual: Arithmetic Mean

Carbon Monoxide

8 Hour: 2nd Max Value
1 Hour: 2nd Max Value



**Figure 3-3:
S.C. Class I Areas**

- 1 - Cape Romain National Wildlife Refuge
- 2 - Joyce Kilmer Memorial Forest
- 3 - Linville Gorge Wilderness Area
- 4 - Great Smoky Mountains National Park
- 5 - Shining Rock Wilderness Area
- 6 - Wolf Island National Wildlife Refuge

Additionally, emissions from sources in South Carolina have the potential to affect other Class I areas which are located in Western North Carolina. The South Carolina Class I areas are the Great Smoky Mountain National Park, Joyce Kilmer Wilderness Area, Shining Rock Wilderness Area, and Linville Gorge Wilderness Area. To assure adverse effects are not caused by new major construction in the Greenville-Spartanburg area, such projects in these areas are required to undergo a Class I review. Current air quality conditions in these Class I areas may make it more difficult to approve new major construction activity near a Class I area.

Applicants proposing projects in these areas are encouraged to meet with the Department and the Class I area's federal land manager to allow an early exchange of project activities, class I area concerns, and ideas for resolution of the concerns. These early communications can facilitate the project review and minimize potential delays in the review process.

Topography

The topography of South Carolina is divided into two distinct areas, commonly known as the Piedmont and the Coastal Plain. The line of demarcation runs from the eastern boundary of Aiken County through central Chesterfield County to the North Carolina border. Along this line, elevations begin at about 300 feet above mean sea level and increase in steps of over 1,000 feet in the extreme northwestern counties, culminating in isolated peaks of 2,000 to over 3,500 feet. East of the line, there is evidence of outcroppings from the lower Appalachians in a ridge of low hill and rather broken country between the Congaree River and the north fork of the Edisto River. Also in a fairly hilly and rolling region in the upper Lynches River drainage basin between the Catawba-Wateree and the Great Pee Dee Rivers. In about one-third of the coastal plain (or what is commonly known as the upper coastal plain), the elevations decrease rather abruptly from 300 to 100 feet, hence to the coast. The major part of the coastal area is not over 60 feet above mean sea level. In this region of lower levels, to the eastward and southward, the great swamp systems of the South Carolina predominate. The slope of the land from the mountain seaward is toward the southeast, and all of South Carolina's streams naturally follow this general direction to the Atlantic Ocean. The South Piedmont section of the State is on the eastern slope of the Appalachian Mountains with the main ridge of the mountains about 30 miles west. To some extent these mountains act as a barrier for the wind and tend to protect the area from the full force of cold air masses during the winter months. The relatively flat areas of the Central Plains and the coastal region allow free air movement and are conducive to effective dispersion of pollutants.

Meteorology and Air Pollution

Meteorological conditions have a great impact on air pollution concentrations. The combination of light winds, a stable atmosphere, terrain, and precipitation results in high concentrations of air pollutants near the surface of the earth. This explains why the Appalachian Mountains and Western States tend to have higher pollution concentrations than the rest of the nation (Figure 3-4, page 31). The meteorological factors are explained below:

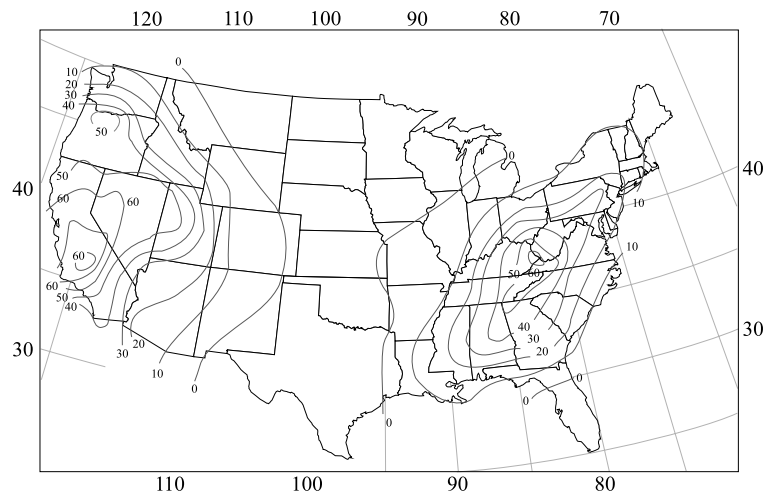


Figure 3-4

The figure shows the potential days of stagnation per year across the United States. Air Stagnation is an air mass that becomes stationary over a region for a relatively long period of time. They generally occur with high pressure and winds are usually light during an episode. Note the maximum over the mountain regions of the Western and Eastern United States. These areas are more susceptible to air stagnation due to valley inversions.

Wind Speed is directly proportional to the dispersion rate of air pollutants. When winds are light or calm, air pollutants tend to be highly concentrated over a small area. If wind speed is higher, the pollutants are dispersed and concentrations are much lower over a small area.

Atmospheric Stability also has a dramatic effect on the concentration of air pollutants. Generally, temperature decreases with height (See Figure 3-5). When the lapse rate (change in temperature with a change in altitude) is higher than normal, the atmosphere becomes unstable; therefore, vertical mixing increases. This disperses pollutants throughout the atmosphere and decreases their concentrations. In contrast, when the lapse rate becomes negative an inversion develops (See Figure 3-6). An inversion is an area of the atmosphere where the temperature increases with height. This is an extremely stable situation and leads to little mixing of air near the earth's surface. This causes air pollutants to become trapped near the surface of the earth.

Unstable

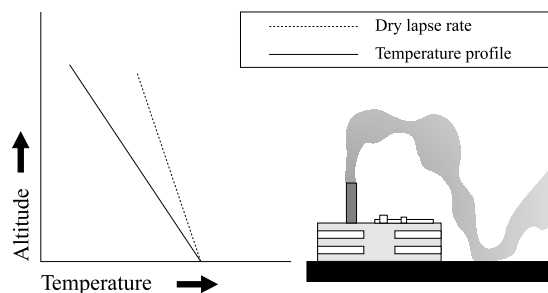
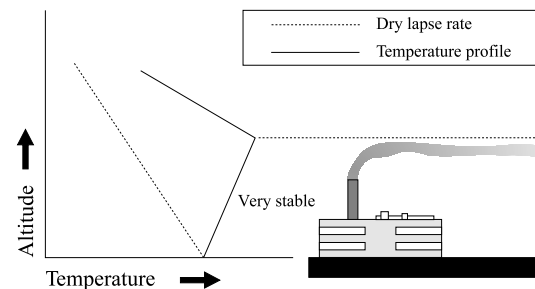


Figure 3-5 (left) shows a lapse rate that allows good dispersion.

Figure 3-6 (right) shows an inversion, which traps pollutants close to the earth's surface.

Inversion



Terrain also influences the dispersion of air pollutants. Valleys and river basins are more susceptible to higher pollutant concentrations than surrounding areas. Inversions occur more frequently on clear calm nights over a valley region due to the density of cold air. On clear, calm nights, radiational cooling is at a maximum, and the colder air settles into the valleys. This result frequently is an inversion layer just above the cold air (Figure 3-7, page 32).



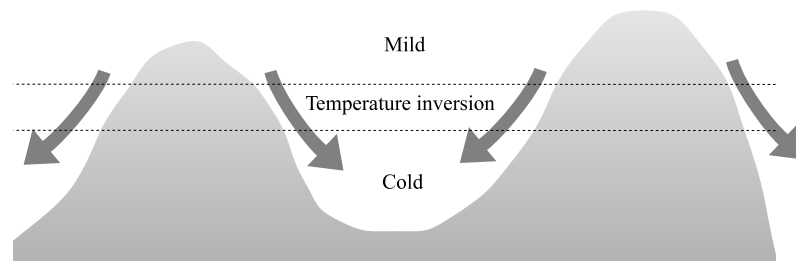


Figure 3-7

Temperature inversions are common in the Appalachian Mountains. On clear nights, with nearly calm winds, dense cold air sinks into the valley forming an inversion.

Precipitation is another factor influencing the concentration of air pollutants. Condensation occurs on pollutant particle cores. In fact, without small particles in the atmosphere, there would be no precipitation. Precipitation lowers the amount of pollutants in the atmosphere. Rain and snow cleans the atmosphere of many pollutants. When air is polluted with oxides of sulfur and nitrogen, the gases interact with the moisture to produce drops of sulfuric acid and nitric acid. This results in acid rain which has destructive effects on soil, in lakes and streams, and on certain types of forests.

Climate

South Carolina's climate is influenced by its latitude, close proximity to the ocean, and its leeward position in respect to the Appalachian Mountains to the northwest. The state is approximately located between 32 degrees North and 35.5 degrees North latitude. This position is where the mid-latitudes and subtropics overlap. The relatively low latitude, the closeness to the warm Gulf of Mexico, and the blocking of arctic air masses by the mountains from the northwest gives the state a mild to warm climate. Precipitation is well distributed throughout the year. The single most influential weather system that dominates weather (for nearly two-thirds of the year) is the Bermuda High.

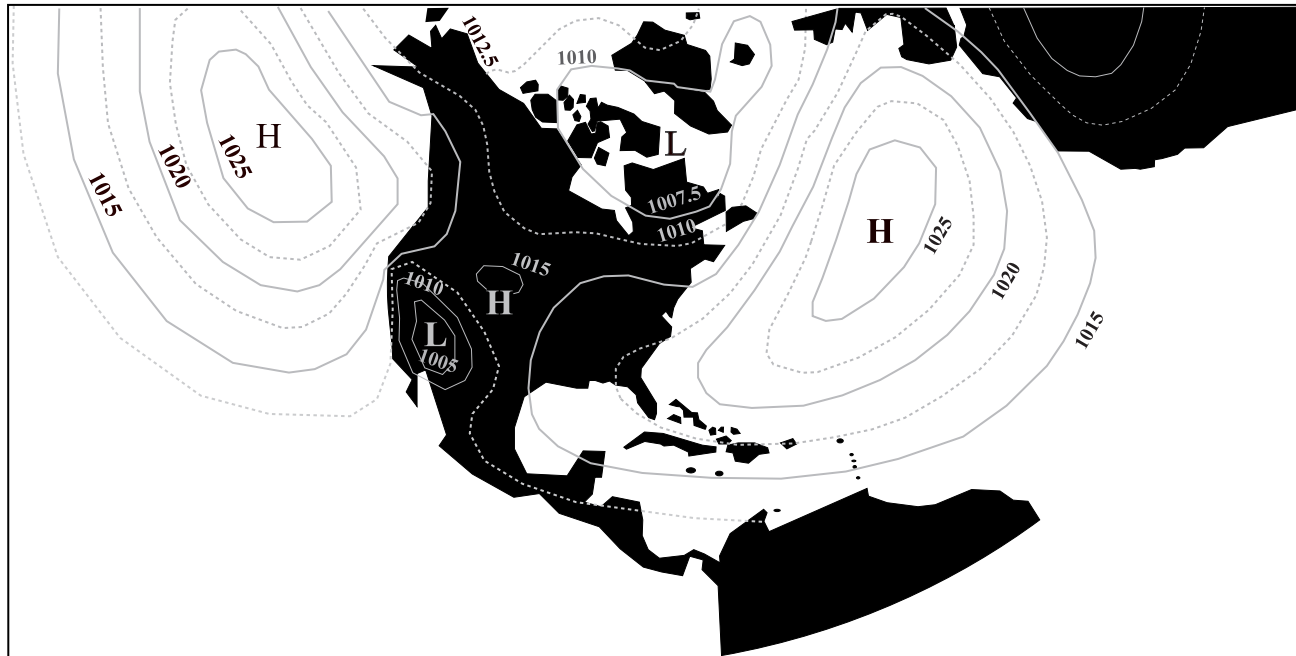
South Carolina has mild winters. The mountains to the northwest slow and sometimes block the intrusion of arctic outbreaks. Snow and ice accumulations are rare over most of the state, except for the northwest corner where one or two accumulations of ice or snow can be expected during a winter. Frost and freezes are common in the northwestern half of the state from December through February. In contrast, hard freezes are unusual along the immediate south coast, with only one or two freezes expected each year.

Summers are quite warm in the Palmetto State. The warm weather persists from May through September. The terrain over most of the state offers little relief from the summer heat. Central portions of the state can expect more than 70 days at or above 90 degrees and seven days at or above 100 degrees for daily maximums. The immediate coast, the mountains, and scattered afternoon thunderstorms usually offer the only relief from summer heat. The Bermuda high controls the weather during the summer months and generally blocks cold fronts from entering the state. During the summer, rainfall occurs from convection cloud forms associated with afternoon heating. Rainfall can also be associated with tropical systems which affect the state from the late summer months into late autumn. Hurricanes such as Hurricane Hugo in 1989 caused widespread destruction along the coast with heavy rainfall well inland.

The Bermuda High

The Bermuda high is a semi-permanent pressure system. The mean position of the Bermuda high is approximately 30 degrees North latitude over the Atlantic Ocean. This is a warm-core high-pressure system that extends well into the upper atmosphere. Near the center of this system, the air sinks and warms, thereby inhibiting cloud cover from developing. The western flank of the Bermuda high dominates the Southeastern United States during the warm months of the year. The western flank of the Bermuda high spreads sultry, tropical air from the Gulf of Mexico and tropical Atlantic over the Southeastern United States. The Bermuda high causes the region's atmosphere to be unstable thus aids in the development of afternoon thunderstorms from June through August.

When the Bermuda high is centered west of its mean position, the air becomes compressed and begins to warm. This results in low relative humidity across the Southeastern United States. As relative humidity decreases, the potential for summer afternoon thundershowers is suppressed, and favorable conditions for drought are created. This type of weather pattern also leads to stagnating air over the region. Air stagnation is a major factor associated with the accumulation of air pollutants near the earth's surface. During the fall, the Bermuda high begins to migrate southward and thus loses most of its influence by late November.



The figure above shows the mean position of the Bermuda High During July. The Western flank ridges into the Southeast United States pumping in warm, moist, unstable air.





1997 South Carolina Weather Summary

The first three months of 1997 were unseasonably warm. Temperatures on New Year's Day were in the balmy 70s over much of the state. A cold snap occurred January 8th through 12th. An area of sleet and freezing rain caused damage to power lines and tree limbs over the upstate on the January 8th. Other than this January cold snap, the remainder of the winter season remained mild to warm. In February, there were nine days with maximum temperatures surpassing 70 degrees in Columbia. On two of these days, the temperature exceeded 80 degrees, and a maximum temperature of 84 degrees occurred on the February 27th tying the all time February daily maximum. The month of March was the warmest March on record in Columbia, with the average temperature of the month exceeding 6 degrees above normal. By early March, most of the dogwoods and azaleas had reached their peak in central and interior coastal sections of the state.

April marked a dramatic change in the weather pattern over South Carolina and the entire Southeast. The pre-mature ridging of the Bermuda high disappeared. As a result, unseasonably cool air masses swept into South Carolina from April through early June. April averaged nearly 3 degrees below average making it colder than March. On the 3rd of April, scattered frost covered much of the upstate and western midlands. Another shot of Canadian air filtered into the state on April 17 which caused some damage to the peach crop in the northwestern sections of the state. On April 22nd, severe thunderstorms swept across Fairfield, Laurens, Aiken, and Horry counties dropping golf ball size hail.

The cooler than normal weather continued into late Spring with temperatures in May and June averaging below normal. A line of severe storms crossed the state on May 9th ahead of a strong cold front. Sections of the Midlands reported strong winds, hail, downed trees, and downed power lines. The first week of June averaged nearly 10 degrees below normal, and numerous record low highs were recorded over the state.

Summer weather arrived much later than usual. Finally, by the end of June, summer-like temperatures arrived. The remainder of the summer featured near normal temperatures with periodic shots of unseasonably cool air in between. The hottest weather occurred from July 3rd through the 5th when temperatures were in the upper 90s statewide. Columbia reached 101 degrees on July 4th, and the heat index in the south coastal regions approached 120 degrees. As with much of the 1997 summer, the intense heat broke after a few days. Several unseasonably strong cold fronts pushed through South Carolina giving many locations in the state record lows in July and August. The remains of Tropical Storm Danny moving northward from the Gulf coast region into the state caused these tropical rains and tornadoes. On July 23, 1997 flooding rains occurred near Charlotte, and violent tornadoes caused damage in Lexington, Richland, and Abbeville counties.

The autumn season featured very little tropical storm activity. Temperatures were warmer than normal in September and October. Late season heat occurred in October with daily maximum temperatures in the 80s to lower 90s from October 5th through October 10th. By November, the typical El Niño weather pattern had developed. A strong subtropical jet stream began to form over the Southern United States. Rainfall averaged above normal over most of South Carolina. In addition, temperatures were below normal. This weather pattern persisted through the month of December. [Note: The South Carolina Department of Natural Resources, State Climatology Office provided information for the 1997 weather summary.]

El Niño

In the late spring of 1997, it was obvious that a strong El Niño was developing in the Equatorial Pacific region. The ocean temperatures continued to rise into the summer, despite that fact that this is normally when ocean temperatures in this region generally cool. By October 1997, ocean temperatures off the South American Equatorial coast were over 9 degrees above normal with area coverage of over two times the size of the continental United States. At this point, the 1997-1998 El Niño had already surpassed the intensity and size of the 1982-1983 El Niño that reeked havoc all over the globe.

By the late fall of 1997, the El Niño weather pattern had been firmly established over the United States. A strong southern jet stream brought numerous southern storm systems from the Pacific across the Southern United States. In addition, a blocking ridge had developed in western Canada bringing the northern and northwestern portions of the United States mild weather while allowing colder polar air to move southward into the Eastern and Southern United States. November 1997 was cold and wet over much of the Southern United States including South Carolina. An unusual snowstorm developed near the Gulf coast in December bringing snow to portions of Louisiana, southern Mississippi, and Alabama. In addition, snow fell in parts of Mexico that had not seen snow in over 100 years and portions of the northern plains were experiencing record highs in the 40s and 50s. The impressive 1997-1998 El Niño will continue to be watched with great anticipation. In South Carolina, we should expect above normal precipitation this winter and spring (1997-1998) with below normal temperatures in the spring.

El Niño is a natural phenomenon that occurs every 2 to 8 years. However, the developing El Niño in 1997 was historic due to the intensity and expansive coverage. During a typical, non-El Niño year, the normal easterly trade winds drag warm surface waters away from the South American coast, allowing convective rainfall to be pushed eastward into Indonesia (Figure 3-9). This allows the cold, nutrient rich waters near the bottom of the ocean to rise up near the surface. This is known as upwelling. During an El Niño year, the normal easterlies weaken or sometimes reverse. The intensity of the El Niño depends on how much the easterlies weaken or even reverse. The weakening or reversal of the trade winds suppresses the normal upwelling of colder ocean waters near the ocean floor. As a result, waters off the South American coast begin to warm. As a result, convective heavy rainfall affects South America and Indonesia experiences drought conditions (Figure 3-10). As early as the 1920s, Sir Gilbert Walker began to link Equatorial Pacific water temperatures with weather patterns around the world.

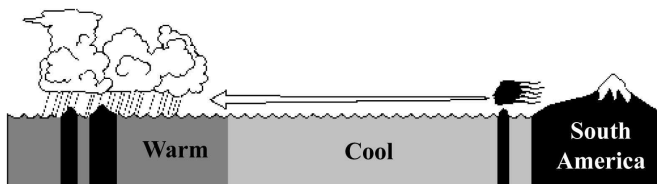


Figure 3-9

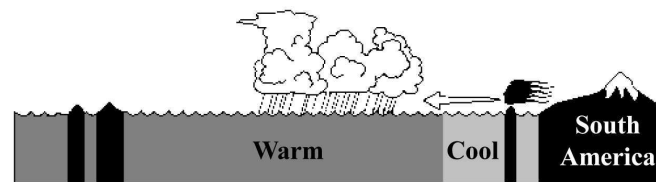


Figure 3-10



Today, scientists have a much better understanding how El Niño couples with our atmosphere to cause extensive changes in the worldwide atmospheric circulation pattern. Scientists believe that El Niño is the second most influential natural phenomenon to affect global weather patterns besides the obvious changes of the seasons that occur each year;

however, these two factors are not the only factors that influence global circulation patterns around the world. In recent years, complex computer models have been developed to help meteorologists and climatologists to better predict and understand the El Niño.

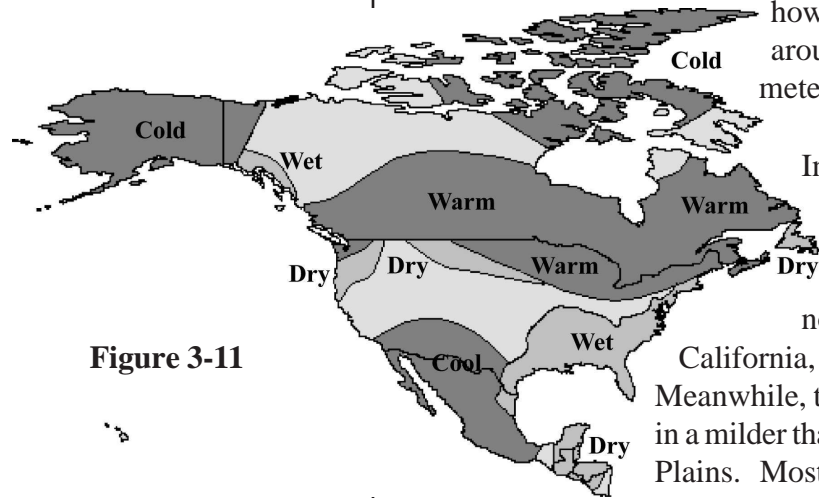


Figure 3-11

In the Northern Hemisphere, the weather patterns linked to El Niño are more pronounced during the winter and early spring seasons. Figure 3-11 represents the affects of the El Niño on the winter season over North America and, Figure 3-12 represents the affects of the El Niño on the spring season over North America. A stronger than normal subtropical jet stream develops in the Pacific ocean eastward through Southern

California, the Southwestern United States, Texas, the Gulf coast, and up the South Atlantic coast. Meanwhile, the northern polar jet stream is displaced well north into Western Canada. This results in a milder than normal winter for the Northwestern United States, Western Canada, and the Northern Plains. Most of the active storm systems move from west to east in the Southern United States.

Areas from Southern California through Texas, the Gulf coast, Florida and the Carolinas experience wetter than normal conditions from November through April. Southern California is particularly hit hard during strong El Niño years; heavy rains, winds, and mudslides cause millions of dollars worth of damage. Ironically, El Niño benefits many areas around the globe. One example of this is the suppression of Atlantic Tropical storm activity in the summer and fall months. This suppression of tropical storm activity is due to an abnormal westerly flow that suppresses the

normal easterly flow in the Atlantic tropical region. In contrast, stronger Pacific tropical storms and hurricanes move further northward and threaten the Southwestern United States due to the abnormally warm waters displaced northward and the disruption of the easterly trade winds.

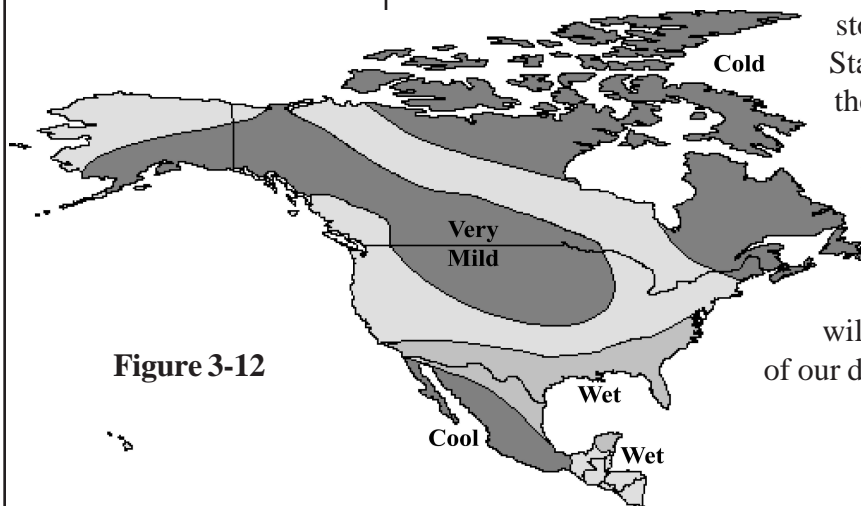


Figure 3-12

El Niño's influence on the world's weather pattern varies from region to region. To some, El Niño is a "scary" word, but for others it is welcomed phenomenon. It is according to one's perspective as to which term one uses to describe this climate machine. As scientists gather more knowledge of this natural phenomenon, fear will dissipate and humanity will begin to see it for what it is. El Niño is an essential part of our delicate energy balance for our globe.

Chapter 4

ENGINEERING SERVICES

The Bureau of Air Quality (BAQ) regulates air emissions in South Carolina. The BAQ enforces State air regulations as well as acting as the delegated authority for the EPA. In order to maintain air pollution laws and regulations, the BAQ has a permitting system for industrial and commercial facilities in the State. All stationary sources of air pollution in South Carolina must comply with permitting requirements before construction may begin. After construction has been completed and requirements satisfied, the BAQ assures continuing compliance through the issuance of operating permits.

State regulations provide the basis for the BAQ permitting system. These regulations allow for the issuance of construction and operating permits, impose limits for particulate matter (PM) and gaseous point and fugitive source emissions, and set minimum acceptable ambient air quality levels. There is also a health-based state standard for air toxics emissions. South Carolina has a State Prevention of Significant Deterioration (PSD) regulation based on the Environmental Protection Agency (EPA) PSD Program. The BAQ has been delegated authority by the EPA to implement New Source Performance Standards (NSPS) and certain National Emission Standards for Hazardous Air Pollutants (NESHAP).

On July 26, 1995, South Carolina received delegation of authority by the EPA to implement the Title V Operating Permit Program codified in South Carolina Regulation 61-62.70. The purpose of the Title V permitting program is to provide a comprehensive air quality operating permit for all major sources of air contaminants (See Figure 4-1, page 38). The Title V operating permit program applies to any major facility defined as having the potential for uncontrolled emissions of 100 tons per year or more and/or which has the potential for uncontrolled emissions of any hazardous air pollutant (HAP) of 10 tons per year or more or any combination of HAPs totaling 25 tons per year or more.

The Engineering Services Division has three permitting sections: Permit Evaluation Section, Air Permitting Section, and the Clean Air Act Permit Implementation Section. The primary responsibility of the Engineering Services Division is the issuance of Construction, Conditional Major, Title V, and State Operating Permits. Examples of sources and industries that require permits include:

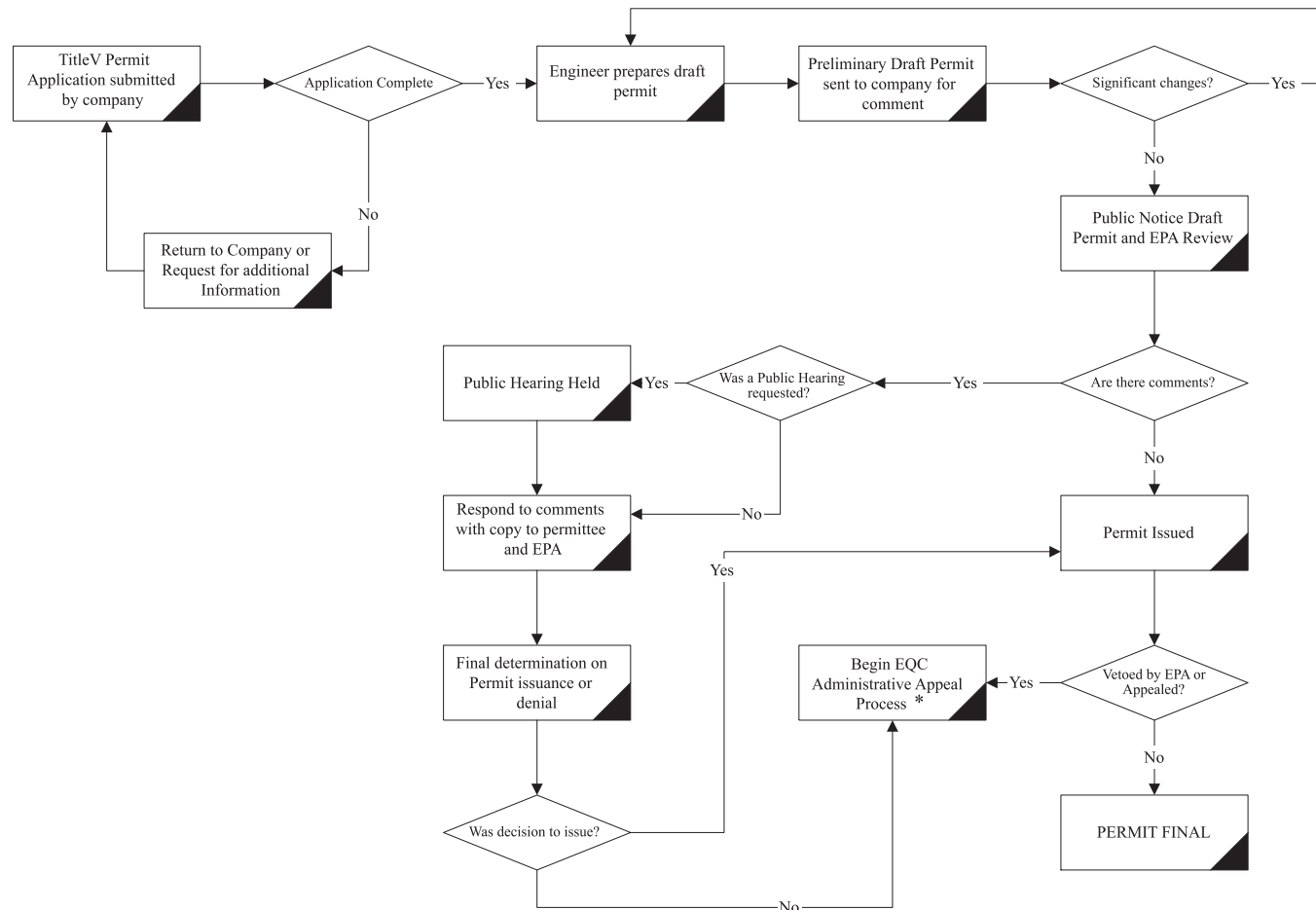
- | | | |
|-----------------------|-------------------------|--------------------------|
| • Boilers | • Metals Refining | • Power Plants |
| • Mines | • Concrete Plants | • Wood Products |
| • Landfills | • Asphalt Plants | • Pulp & Paper Industry |
| • Hospitals | • Hazardous Waste/ | • Federal Facilities/SRS |
| • Chemical Facilities | Commercial Incineration | |

Engineers in the three air permitting sections review plans for construction and operation of sources and any necessary emission control devices. Upon approval, the owner/operator of the source receives a permit addressing applicable Federal and State air regulations and standards. The conditions of the permit provide the rules, instruction and guidance for the construction, operation and maintenance of equipment. These conditions must be practicable and enforceable. Conditions are written with the owner, inspector, and the public in mind.



Permits issued...

Construction	1113
PSD Construction	15
State Operating	393
Title V Operating	0
Conditional Major:	
Individual	14
General Permits:	
Textile Greige	7
Fuel Combustion	14
Hot Mix Asphalt	45
Concrete Batch	10



*For details, contact the Office of General Counsel at (803) 734-4910.

Figure 4-1: Title V Permit Drafting Process

Chapter 5

ENVIRONMENTAL QUALITY CONTROL - Air Quality Partners

Small Business Assistance Program

The 1990 Clean Air Act Amendments are considered among the most comprehensive environmental laws ever enacted in this country. Many of these requirements affect small businesses that often cannot afford to hire staffs of environmental experts to interpret the complex regulations. Realizing that the costs of failing to comply can be quite high, Congress established a program to provide small businesses with technical assistance to help them meet clean air requirements. Under the 1990 amendments, each state was required to implement a Small Business Stationary Source Technical and Environmental Compliance Assistance Program. The Small Business Assistance Program (SBAP) has three parts: a technical assistance program, an ombudsman to serve as small business advocate, and a compliance advisory panel to evaluate program effectiveness.

Because numerous definitions already exist, Congress created its own definition of small businesses for the purposes of the Clean Air Act. A small business is a stationary source of emissions that:

- Is owned or operated by a person employing 100 or fewer individuals.
- Is a small business concern as defined in the Small Business Act.
- Is not a major stationary source as defined in the Clean Air Act Amendments Titles I and III.
- It does not emit more than 50 tons per year of any regulated pollutant.
- It emits fewer than 75 tons per year of all regulated pollutants.

Environmental technical assistance to South Carolina small businesses is available from the SBAP at the Department of Health and Environmental Control (DHEC). The SBAP is a non-regulatory service of DHEC that has helped approximately 400 small businesses since 1993. Some of the ways the SBAP office can help small businesses include:

- Helping owners determine which regulations apply to their business.
- Informing business owners of their rights and obligations.
- Sending technical and compliance information to small businesses.
- Providing information on pollution prevention and accidental release prevention and detection.
- Providing confidential one-on-one consultation through an audit program.
- Acting as an advocate and liaison to regulatory staff when businesses request modifications of work practices or approval of technological methods of compliance.

The Small Business Ombudsman located at DHEC's Office of Environmental Quality Control will serve as advocate for owners. Some of the duties of the Ombudsman include:



Mailing Address

DHEC
EQC Administration
2600 Bull Street
Columbia, SC 29201

Telephone

(803) 734-5909
1-800-819-9001

Web Site

[http://www.state.sc.us/
dhec/sbap.html](http://www.state.sc.us/dhec/sbap.html)

E-mail

[copelapt@
columb30.dhec.state.sc.us](mailto:copelapt@columb30.dhec.state.sc.us)

***Small Businesses
that may need permits...***

- Abrasive Blasting
- Autobody Shops
- Concrete Batch Plants
- Cotton Gins
- Crematories
- Drycleaners
- Fiberglass product manufacturing
- Foundries
- Furniture manufacturing
- Grain elevators, silos
- Incinerators
- Industrial furnaces/ovens
- Marble manufacturing
- Organic and inorganic chemical manufacturers
- Paint manufacturers and applicators
- Plating operations
- Printing shops/graphic arts companies
- Rubber and tire manufacturers
- Sand and gravel operations
- Soil remediation
- Solvent cleaning
- Surface coating

- Refer small business owners to the appropriate technical specialists.
- Review and comment on regulations that affect small businesses.
- Outreach to the small business community.
- Participate and sponsor meetings and conferences with regulatory officials, industry groups, and small business representatives.
- Help investigate and resolve complaints and disputes from small businesses against DHEC's air program.
- Seek public and private funding sources that can financially assist small businesses in complying with air pollution control laws.
- Periodically evaluating the effectiveness of services and customer satisfaction.

South Carolina's small business assistance effort has a Compliance Advisory Panel that helps determine the overall effectiveness of the SBAP. The panel reviews SBAP technical materials to ensure they are understandable to the layperson. The panel independently oversees the SBAP and the ombudsman and reports its findings to DHEC and the Environmental Protection Agency.

According to Federal law, panel membership will be chosen in the following manner:

- The Governor will select two members who are not owners or representatives of owners of small businesses to represent the general public.
- The Commissioner will select one member to represent DHEC.
- The General Assembly will select four members who are owners or representatives of owners of small business stationary sources. One shall be appointed by each of the following: the majority leader of the Senate, by the minority leader of the Senate, the majority leader of the House of Representatives and the minority leader of the House of Representatives.

EQC District Offices - Air Sections

There are twelve Environmental Quality Control (EQC) District Offices located strategically around the state (See Appendix D, page 63). The number of district personnel in each office varies from district to district based on factors such as size of the area covered, population, and the amount of development and regulated activities occurring in a particular area. District personnel are comprised of some or all of the following specialties: administrative support, engineers, environmental quality managers, and scientists. The districts are involved in most EQC programs including water and wastewater quality, drinking water supply, air quality, solid waste, hazardous waste, recreational waters, radiological health and, on the coast, shellfish monitoring.

District air personnel are involved in many functions related to the various EQC services. These functions include laboratory services and support, compliance services and support, permitting services and support, and public services and support.

Laboratory services and support requires the district air personnel to be involved in collecting samples and data at various monitoring sites throughout the State. The district air personnel are also involved in air quality sampling during emergency situations.

Compliance services and support involves conducting inspections of major and minor facilities. Once the inspections are completed, reports are written documenting the inspection. District air personnel consult with other districts on issues related to inspections, techniques, and the compliance of industry. The district air personnel also receive and review industrial facility exceedance reports, attend hearings and enforcement conferences, and provide other support as necessary.

Permitting services and support includes three main tasks: consultations with facilities, central office, and the general public, review of Prevention of Significant Deterioration (PSD) permits and final construction permits, inspection of regulated facilities, and preparation of written reports.

The public services and support function of the district air personnel include receiving, documenting, and investigating citizen complaints. For example, opening burning investigations are conducted to ensure adherence to DHEC's Open Burning Regulations. District air personnel provide interpretation and assistance to citizens in understanding the various Federal and State regulations and standards, provide public information, education coordination, and obtaining accurate and precise information for DHEC news releases. The district air personnel are also involved with coordinating and responding to such emergencies as fires, spills, fish kills, and releases.

Division of Air Quality Analysis

The Division of Air Quality Analysis (DAQA), a part of the Bureau of Environmental Services, operates ambient air monitoring stations throughout the state to support the activities of the Air Quality program. These ambient air monitors provide information which is used: (1) to assess compliance with the regulations limiting pollutant concentrations, (2) to detect sources that may contribute to violations of the standards, (3) to establish back ground pollution levels, (4) to evaluate trends, and (5) to provide a warning in case of a possible air pollution episode.

The DAQA is responsible for the maintenance and operation of the monitoring sites, samplers, and monitors, and the validation, quality assurance, and reporting of ambient monitoring data. The division also provides laboratory and analytical support for the Air Quality program and the districts. Microscopic analysis of asbestos bulk samples is performed to support the asbestos program. Certification for Bulk Asbestos analysis is maintained through the National Voluntary Laboratory Accreditation Program. Microscopic examination of ambient particulate collected on the Total Suspended Particulate (TSP) filters and in special samples can be performed to help identify possible sources.

Air monitoring...

There are 64 monitoring sites throughout South Carolina.



NAAQS Criteria Pollutants

Ozone (O₃)

Sulfur Dioxide (SO₂)

Nitrogen Dioxide (NO₂)

Particulate Matter
(PM₁₀ & PM_{2.5})

Carbon Monoxide (CO)

Lead (Pb)

South Carolina Air Pollutants

Total Suspended
Particulates (TSP)

Gaseous Fluorides (HF)

Ambient Air Monitoring Network

The State network of samplers and monitors is designed to meet both State and Federal monitoring objectives (See Appendix E, page 73). Monitoring for criteria pollutants, those that have a National Ambient Air Quality Standard (NAAQS) established, and noncriteria pollutants is performed. All samplers are designated as either a State and Local Air Monitoring Station (SLAMS), a National Air Monitoring Station (NAMS), or a Special Purpose Monitor (SPM).

The SLAMS network is designed to meet four main objectives:

- Determine the highest concentrations expected to occur in the State.
- Determine representative concentrations in areas of high population density.
- Determine the impact on ambient pollution levels of significant sources or source categories.
- Determine general background concentration levels.

State and Local Air Monitoring Stations (SLAMS) are chosen jointly by EPA Region IV and DHEC. This forms the backbone of the monitoring network.

The 8 NAMS sites are a subset of the SLAMS network and are used to provide data for national policy analysis. The sites are biased toward expected maximum concentrations and high population density. They are chosen in cooperation with EPA and operated and maintained by DAQA as part of the national long term air quality monitoring system.

The SPMs, or Special Purpose Monitors, provide information needed for state and local questions. They may monitor criteria pollutants, pollutants that have a State standard such as TSP or any other pollutant of interest. Data is collected to monitor the quality of the air relative to South Carolina Ambient Air Quality Standards or address specific local concerns. These monitors may be part of short and long term special studies and often complement the SLAMS and NAMS.

There are also eight acid precipitation stations in South Carolina. Precipitation samples are routinely analyzed for pH, conductivity, and specific ions.

The methods used by the DAQA to monitor ambient concentrations of criteria pollutants are reference or equivalent methods as described in the Appendices to 40 CFR Part 50. Methodology that is specific for South Carolina instrumentation, the monitoring of State regulated pollutants, and noncriteria compounds are described in the DAQA Quality Assurance Manual.

The methods used to monitor compounds in ambient air can generally be classified as continuous or integrated.

Continuous methods, used for the gaseous criteria pollutants (ozone, sulfur dioxide, carbon monoxide, and nitrogen dioxide), particulates (PM₁₀ and PM_{2.5}, the inhalable fractions), and meteorology can provide real time concentrations of individual species 24 hours a day. The data is accumulated at the site and recovered by computer over phone lines each day but can also be accessed at any time to check concentrations. This information is generally reported as hourly averages of the individual readings. The monitors at these sites require climate-controlled buildings for the instruments.

Integrated samples are collected over longer periods of time, typically from two to 48 hours. The analysis of the sample in the laboratory provides an average pollutant concentration for the period sampled. Integrated sampling includes TSP, lead, fluorides, and organic sample for volatile and semi-volatile organic compounds and carbonyls. Although the information is not available as quickly, the large amount of air sampled can provide better sensitivity.

Ambient Monitoring Methods

The Air Quality Assurance Section assures quality data that are complete, representative, accurate, precise, and comparable. In order to ensure representativeness of data, only EPA reference or equivalent methods are used. In addition, EPA guidelines are followed in the selection of sites. To prevent data of unknown quality from being reported, a series of data validation procedures are carried out. This removes questionable data resulting from human errors and/or analyzer problems. All data are corrected to standard temperature and pressure of 25°C and 760 mm Hg. This allows comparability among data groups.

Pollutant	Federal Register 40 CFR Part 50	DAQA Quality Assurance Manual
Carbon Monoxide (CO)	Appendix C	Appendix AJ
Lead (Pb)	Appendix G	Appendix Q
Nitrogen Dioxide (NO ₂)	Appendix F	Appendix AK
Ozone (O ₃)	Appendix D	Appendix Z & AN
Particulate Matter 10 (PM ₁₀)	Appendix J	Appendix AF & AO
Particulate Matter - fine (PM _{2.5})	Appendix L	---
Sulfur Dioxide (SO ₂)	Appendix A	Appendix AM
Total Suspended Particulate (TSP)	Appendix B	Appendix P

In order to assess the potential problems of acid precipitation in South Carolina, four monitoring stations were established during the early 1980s. One monitoring site in Oconee County, near Longcreek, represents the high elevations of the

Air monitoring...

There are 143 monitors across South Carolina.

102 for national and state regulated pollutants;

19 for local meteorology (wind and rain);

14 for miscellaneous (mercury and organic compounds); and,

8 to characterize precipitation (1 for mercury, the rest for acid precipitation).

Monitoring Trends on the Internet...

*[http://www.state.sc.us/
dhec/baq_home.htm](http://www.state.sc.us/dhec/baq_home.htm)*



State. A second site, Delta, located in Union County near Whitmire, represents the Piedmont area. A third site located in the Congaree National Monument in Richland County represents the divide between the Piedmont region and coastal plains. A fourth site was chosen in the Cape Romain National Wilderness Area in Charleston County. All four sites were fully operational during calendar year 1983. Two new sites were established during the latter part of 1988: at the Cowpens National Battlefield in Cherokee County and Parklane in Richland County just northeast of Columbia. A new site was established at Barnwell in 1989.

Concentration Reporting

In this report, the concentrations of air pollutants are reported in the units used in the National Ambient Air Quality Standards and the South Carolina Ambient Air Quality Standards. The factors in the table below can be used to make the most common conversions between values expressed as Mass per Volume ($\mu\text{g}/\text{m}^3$ and mg/m^3) and those reported as Volume to Volume ratios (ppm). Converted values are provided as a convenience.

1 ppm = 1 part per million = 1 volume of a gaseous pollutant in 1,000,000 volumes of air

1 $\mu\text{g}/\text{m}^3$ = 1 microgram per cubic meter = .000001 gram pollutant in 1 cubic meter of air

1 mg/m^3 = 1 milligram per cubic meter = .001 gram pollutant in 1 cubic meter of air

Pollutant	PPM to μ/m^3	μ/m^3 to PPM	mg/m^3 to PPM
O ₃	1961	5.10×10^{-4}	0.00051
NO ₂	1887	5.32×10^{-4}	0.00053
SO ₂	2632	3.83×10^{-4}	0.00038
CO	1.15	---	0.86957

To convert a pollutant concentration value, multiply by the appropriate factor in the table above. All concentrations and volumes in this report are reported at the reference temperature of 25° C and a pressure of 760 millimeters of mercury, as specified for all National Ambient Air Quality and South Carolina Ambient Air Quality Standards.

Pollutant Standards Index

The Pollutant Standards Index (PSI) is an air quality index that was developed by the EPA in cooperation with the Council on Environmental Quality. The PSI provides a simple, uniform way to report daily air pollution concentrations, and to tell the public about the general health effects associated with local air quality during the past twenty-four hours.

The PSI is a reporting tool that converts the pollutant concentrations measured in a community's air to a simple number on a scale of 0 to 500. Intervals on the scale are related to the potential health effects of the daily measured concentrations of five major pollutants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide and particulate matter (dust). The table below provides an explanation of the significance of the PSI values.

Index Value	PSI Descriptor	General Health Effects	Cautionary Statements
500	Hazardous	Premature death of ill and elderly. Healthy people will experience adverse symptoms that will affect their normal activity.	All persons should remain indoors, keeping windows and doors closed. All persons should minimize physical exertion and avoid traffic.
400		Premature onset of certain diseases in addition to significant aggravation of symptoms and decreased exercise tolerance in healthy persons.	Elderly and persons with existing diseases should stay indoors and avoid physical exertion. General population should avoid outdoor activity.
300			
200	Very Unhealthful	Significant aggravation of symptoms and decreased exercise tolerance in persons with heart or lung disease with widespread symptoms in healthy population.	Elderly and persons with existing heart or lung disease should stay indoors and reduce physical activity.
100	Unhealthful	Mild aggravation of symptoms in susceptible person, with irritation symptoms in the healthy population.	Persons with existing heart or respiratory ailments should reduce physical exertion and outdoor activity.
50	Moderate	N/A	N/A
0	Good	N/A	N/A

An index value of 100 was selected to correspond to the short-term standard for each pollutant, below which adverse health effects have not been observed. Each standard has built into it a margin of safety that, based on our current knowledge, protects the more highly susceptible members of the public.

This index has been available to the public in the Charleston area since November 1981. On March 1, 1984, the index became available in the Columbia, Greenville and Spartanburg areas. This index is prepared by DHEC and disseminated by the office of the American Lung Association of South Carolina. The National Weather Service is a cooperating agency through the use of its National Weather Wire.



Mobile source facts...

Transportation sources contribute more than 50% of the total amount of man-made air pollution in South Carolina.





The mean PSI value for the State during 1997 was 39. The chart below includes the cities where PSI values are available, the total number of days sampled, and the yearly PSI value for each area sampled. In each area, days with moderate PSI (51-100) and unhealthy PSI (>101) values are due to ozone (O₃) formation.

City/Metro Area	Good	Moderate	Unhealthful	Average PSI
Aiken	228	137	0	44
Charleston	277	88	0	41
Columbia	235	130	0	44
Rock Hill	196	164	0	50
Spartanburg, Greenville, Anderson	211	154	0	48

Attainment Status

A nonattainment area is defined as any area where air monitoring data does not meet one or more of National Ambient Air Quality Standards. South Carolina enjoys some of the best air quality in the United States. As indicated in the Figure 5-1, South Carolina is one of a few states that currently meet all National Ambient Air Quality Standards. Meeting the standards is important to South Carolinians since clean air has a direct impact on our health, quality of life and the state's economy. Sampling data continues to show that the entire state is in attainment of the National Ambient Air Quality Standards (NAAQS).

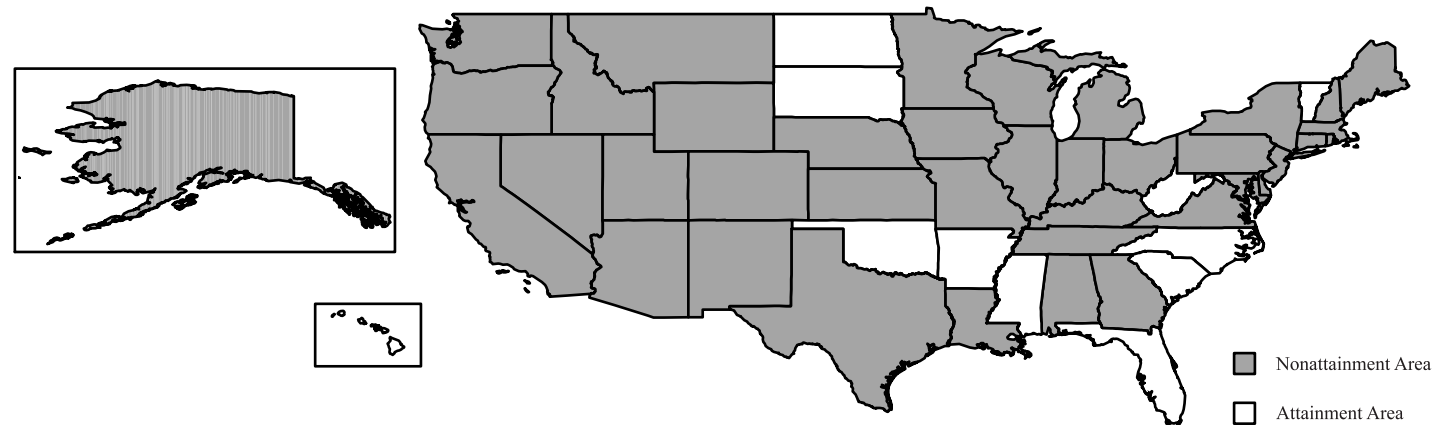


Figure 5-1

SC Air Pollution Regulation 61–62.5

Air Pollution Standard No. 2, Ambient Air Quality Standards

The following table lists the ambient air quality standards for the State of South Carolina. The analytical methods to be used will be those applicable Federal Reference Methods published in 40 CFR 50, Appendices A-H as revised July 1, 1986. With fluorides, either the double paper tape sampler method (ASTMD-3266-79) or the sodium bicarbonate-coated glass tube and particulate filter method (ASTM D-3268-78) may be used.

Pollutant	Measuring Interval	Measurement	Notes
Sulfur Dioxide (SO ₂)	3hr/24hr/Annual	1300/365/80 µg/m ³	4/4/1,2
Total Suspended Particulates (TSP)	Annual geometric mean	75 µg/m ³	1,2
Particulate matter 10 (PM ₁₀)	24hr/Annual	50/150 µg/m ³	3/3
Carbon Monoxide (CO)	1hr/8hr	40/10 mg/m ³	1,2/1,2
Ozone (O ₃)	1hr/8hr	0.12/0.08 ppm	3/3
Gaseous fluorides (HF)	12hr avg/24hr avg	3.7/2.9 µg/m ³	1,2/1,2
	1wk avg/1month avg	1.6/0.8 µg/m ³	1,2/1,2
Nitrogen Dioxide (NO ₂)	Annual	100 µg/m ³	1,2
Lead (Pb)	Calendar quarterly mean	1.5 µg/m ³	1,2
Notes: (1)Arithmetic Average except in case of total suspended particulate matter. (2)At 25° and 760 mm Hg. (3)Attainment determinations will be made based on the criteria contained in Appendices H and K, 40 CFR 50, July 1, 1987. (4)Not to be exceeded more than once a year.			





Statewide Ambient Air Issues

Pollutant	Sources	Health Effects	Environmental Effects	Test Method
Particulate Matter (PM ₁₀ & TSP)	Power plant boilers, steel mills, cement plants, unpaved roads, parking lots, and plants.	Respiratory effects like chemical asthma and emphysema. Aggravates heart and lung problems. May carry toxic materials deep into the respiratory system.	Impairs visibility.	PM ₁₀ refers to particulate matter with an aerodynamic diameter of 10 micrometers or less. The particulate concentrations are determined using both integrated and continuous methods. Both methods use a size-selective inlet to remove the larger particulate from the air stream. The integrated sample uses an 8"x10" quartz fiber filter and sample very similar to that used for TSP and lead. The continuous monitoring of PM ₁₀ is accomplished using a Tapered Element Oscillating Microbalance (TEOM) or Beta attenuation. The results from the continuous monitors are also reported as a 24-hour average.
Sulfur Dioxide (SO ₂)	Power plant boilers and sulfuric acid plants.	Respiratory irritant. Aggravates heart and lung problems.	Impairs visibility. May damage marble, iron, steel and severely damage crops and natural vegetation.	Continuous analyses are accomplished by flame photometry or fluoresce detection. In presence of moisture and oxygen, sulfur dioxide can convert to sulfuric acid.
Carbon Monoxide (CO)	Motor vehicle exhausts.	Is absorbed by the blood stream readily, thus interfering with the absorption of oxygen. Impairs vision, causes dizziness, and can lead to unconsciousness and death.	None known.	Continuous analysis is performed by the nondispersive infrared or the Gas Filter Correlation method.
Ozone (O ₃)	Formed in the atmosphere when hydrocarbons, nitrogen oxides, and ultraviolet light are present.	Irritating to mucous membranes, aggravates heart and lung diseases, and reduces lung function.	Damaging to plants, rubber, dyes, and some textiles.	Continuous analysis is conducted by using the ethylene phase chemiluminescent method or the UV Photometric method.
Nitrogen Dioxide (NO ₂)	Motor vehicle exhaust, smelting, and lead-acid battery manufacturing. Precursor to ozone.	Respiratory irritant. Aggravates heart and lung problems.	Causes brown discoloration of the atmosphere.	Continuous analysis is accomplished using the ozone phase chemiluminescent method.
Lead (Pb)	Motor vehicle exhaust, smelting, and lead-acid battery manufacturing.	Toxic to the nervous system, organs, and most levels of body function.	None known.	Integrated 24-hour samples for lead analyses are collected on 8"x11" preweighed fiberglass filters using a high volume air sampler. A portion of the filter is extracted and analyzed using atomic absorption spectrophotometry.
Gaseous Fluorides (HF)	Glass fiber manufacturing aluminum reduction.	Highly toxic, as well as irritating.	Damaging to plants, affecting growth and development, causes lesions, and may result in the death of plants.	Continuous analysis is performed by the double tape sampler method (ASTM D-3266-79).

Appendix A:

EPA 112(r) List of Regulated Substances

Regulated Substance	CAS No.	TQ*	Regulated Substance	CAS No.	TQ*
1,1-Dichloroethylene	75-35-4	10,000	2-Propenal	107-02-8	5,000
1,1-Dimethylhydrazine	57-14-7	15,000	2-Propenenitrile	107-13-1	20,000
1,2-Ethanediamine	107-15-3	20,000	2-Propenenitrile, 2-methyl-	126-98-7	10,000
1,2-Propadiene	463-49-0	10,000	2-Propenoyl chloride	814-68-6	5,000
1,3-Butadiene	106-99-0	10,000	3-Methyl-1-butene	563-45-1	10,000
1,3-Butadiene, 2-methyl-	78-79-5	10,000	Acetaldehyde	75-07-0	10,000
1,3-Pentadiene	504-60-9	10,000	Acetic acid ethenyl ester	108-05-4	15,000
1-Buten-3-yne	689-97-4	10,000	Acetylene	74-86-2	10,000
1-Butene	106-98-9	10,000	Acrolein	107-02-8	5,000
1-Butyne	107-00-6	10,000	Acrylonitrile	107-13-1	20,000
1-Chloropropylene	590-21-6	10,000	Acrylyl chloride	814-68-6	5,000
1-Pentene	109-67-1	10,000	Allyl alcohol	107-18-6	15,000
1-Propene	115-07-1	10,000	Allylamine	107-11-9	10,000
1-Propene, 1-chloro-	90-21-6	10,000	Ammonia (anhydrous)	7664-41-7	10,000
1-Propene, 2-chloro-	557-98-2	10,000	Ammonia (conc 20% or greater)	7664-41-7	20,000
1-Propene, 2-methyl-	115-11-7	10,000	Arsenous trichloride	7784-34-1	15,000
1-Propyne	74-99-7	10,000	Arsine	7784-42-1	1,000
2,2-Dimethylpropane	463-82-1	10,000	Aziridine	151-56-4	10,000
2-Butenal	4170-30-3	20,000	Aziridine, 2-methyl	75-55-8	10,000
2-Butenal, (e)-	123-73-9	20,000	Benzene, 1,3-diisocyanato-2-methyl-	91-08-7	10,000
2-Butene	107-01-7	10,000	Benzene, 1,3-diisocyanatomethyl-	26471-62-5	10,000
2-Butene, (E)	624-64-6	10,000	Benzene, 2,4-diisocyanato-1-methyl-	584-84-9	10,000
2-Butene-cis	590-18-1	10,000	Bis(chloromethyl) ether	542-88-1	1,000
2-Butene-trans	624-64-6	10,000	Borane, trichloro-	10294-34-5	5,000
2-Chloropropylene	557-98-2	10,000	Borane, trifluoro-	7637-07-2	5,000
2-Methyl-1-butene	563-46-2	10,000	Boron trichloride	10294-34-5	5,000
2-Methylpropene	115-11-7	10,000	Boron trifluoride	7637-07-2	5,000
2-Pentene, (E)-	646-04-8	10,000	Boron trifluoride compound with methyl ether (1:1)	353-42-4	15,000
2-Pentene, (Z)-	627-20-3	10,000	Boron, trifluoro [oxybis[methane], (T-4)-	353-42-4	15,000
2-Propanamine	75-31-0	10,000	Bromine	7726-95-6	10,000
2-Propen-1-amine	107-11-9	10,000			
2-Propen-1-ol	107-18-6	15,000			

<u>Regulated Substance</u>	<u>CAS No.</u>	<u>TQ*</u>	<u>Regulated Substance</u>	<u>CAS No.</u>	<u>TQ*</u>
Bromotrifluoroethylene	598-73-2	10,000	Dimethylamine	124-40-3	10,000
Butane	106-97-8	10,000	Dimethyldichlorosilane	75-78-5	5,000
Butane, 2-methyl-	78-78-4	10,000	Dimethylhydrazine	57-14-7	15,000
Butene	25167-67-3	10,000	Epichlorohydrin	106-89-8	20,000
Carbon disulfide	75-15-0	20,000	Ethanamine	75-04-7	10,000
Carbon oxide sulfide (COS)	463-58-1	10,000	Ethane	74-84-0	10,000
Carbonic dichloride	75-44-5	500	Ethane, 1,1'-oxybis-	60-29-7	10,000
Carbonochloridic acid, 1-methylethyl ester	108-23-6	15,000	Ethane, 1,1-difluoro-	75-37-6	10,000
Carbonochloridic acid, methylester	79-22-1	5,000	Ethane, chloro-	75-00-3	10,000
Carbonochloridic acid, propylester	109-61-5	15,000	Ethanedinitrile	460-19-5	10,000
Carbonyl sulfide	463-58-1	10,000	Ethaneperoxoic acid	79-21-0	10,000
Chlorine	7782-50-5	2,500	Ethanethiol	75-08-1	10,000
Chlorine dioxide	10049-04-4	1,000	Ethene	74-85-1	10,000
Chlorine monoxide	7791-21-1	10,000	Ethene, 1,1-dichloro-	75-35-4	10,000
Chlorine oxide	7791-21-1	10,000	Ethene, 1,1-difluoro-	75-38-7	10,000
Chlorine oxide (ClO ₂)	10049-04-4	1,000	Ethene, bromotrifluoro-	598-73-2	10,000
Chloroethane	75-00-3	10,000	Ethene, chloro-	75-01-4	10,000
Chloroform	67-66-3	20,000	Ethene, chlorotrifluoro-	79-38-9	10,000
Chloromethane	74-87-3	10,000	Ethene, ethoxy-	109-92-2	10,000
Chloromethyl ether	542-88-1	1,000	Ethene, fluoro-	75-02-5	10,000
Chloromethyl methyl ether	107-30-2	5,000	Ethene, methoxy-	107-25-5	10,000
Crotonaldehyde	4170-30-3	20,000	Ethene, tetrafluoro-	116-14-3	10,000
Crotonaldehyde, (E)-	123-73-9	20,000	Ethyl acetylene	107-00-6	10,000
Cyanogen	460-19-5	10,000	Ethyl chloride	75-00-3	10,000
Cyanogen chloride	506-77-4	10,000	Ethyl cyanide	107-12-0	10,000
Cyanogen chloride ((CN)Cl)	506-77-4	10,000	Ethyl ether	60-29-7	10,000
Cyclohexanamine	108-91-8	15,000	Ethyl mercaptan	75-08-1	10,000
Cyclohexylamine	108-91-8	15,000	Ethyl nitrite	109-95-5	10,000
Cyclopropane	75-19-4	10,000	Ethylene	74-85-1	10,000
Diborane	19287-45-7	2,500	Ethylene oxide	75-21-8	10,000
Diborane(6)	19287-45-7	2,500	Ethylenediamine	107-15-3	20,000
Dichloromethyl ether	542-88-1	1,000	Ethyleneimine	151-56-4	10,000
Dichlorosilane	4109-96-0	10,000	Ethyne	74-86-2	10,000
Difluoroethane	75-37-6	10,000	Fluorine	7782-41-4	1,000
			Formaldehyde	50-00-0	15,000

<u>Regulated Substance</u>	<u>CAS No.</u>	<u>TQ*</u>	<u>Regulated Substance</u>	<u>CAS No.</u>	<u>TQ*</u>
Formaldehyde (solution)	50-00-0	15,000	Methane, oxybis-	115-10-6	10,000
Formic acid, methyl ester	07-31-3	10,000	Methane, oxybis[chloro-	542-88-1	1,000
Furan	110-00-9	5,000	Methane, tetranitro-	509-14-8	10,000
Hydrazine	302-01-2	15,000	Methane, trichloro-	67-66-3	20,000
Hydrazine, 1,1-dimethyl-	57-14-7	15,000	Methanesulphenyl chloride, trichloro-	594-42-3	10,000
Hydrazine, methyl-	60-34-4	15,000	Methanethiol	74-93-1	10,000
Hydrochloric acid			Methyl chloride	74-87-3	10,000
(conc. 37% or greater)	7647-01-0	15,000	Methyl chlorocarbonate	79-22-1	5,000
Hydrocyanic acid	74-90-8	2,500	Methyl chloroformate	79-22-1	5,000
Hydrofluoric acid			Methyl ether	115-10-6	10,000
(conc. 50% or greater)	7664-39-3	1,000	Methyl formate	107-31-3	10,000
Hydrogen	1333-74-0	10,000	Methyl hydrazine	60-34-4	15,000
Hydrogen chloride (anhydrous)	7647-01-0	5,000	Methyl isocyanate	624-83-9	10,000
Hydrogen chloride (gas only)	7647-01-0	5,000	Methyl mercaptan	74-93-1	10,000
Hydrogen cyanide	74-90-8	2,500	Methyl thiocyanate	556-64-9	20,000
Hydrogen fluoride (anhydrous)	7664-39-3	1,000	Methyltrichlorosilane	75-79-6	5,000
Hydrogen selenide	7783-07-5	500	Monoethylamine	75-04-7	10,000
Hydrogen sulfide	7783-06-4	10,000	Monomethylamine	74-89-5	10,000
Iron carbonyl (Fe(CO) ₅), (TB-5-11)-	13463-40-6	2,500	Nickel carbonyl	13463-39-3	1,000
Iron, pentacarbonyl-	13463-40-6	2,500	Nitric acid (conc. 80% or greater)	7697-37-2	15,000
Isobutane	75-28-5	10,000	Nitric oxide	10102-43-9	10,000
Isobutyronitrile	78-82-0	20,000	Nitrogen oxide (NO)	10102-43-9	10,000
Isopentane	78-78-4	10,000	Nitrous acid, ethyl ester	109-95-5	10,000
Isoprene	78-79-5	10,000	Oleum (fuming sulfuric acid)	8014-95-7	10,000
Isopropyl chloride	75-29-6	10,000	Oxirane	75-21-8	10,000
Isopropyl chloroformate	108-23-6	15,000	Oxirane, (chloromethyl)-	106-89-8	20,000
Isopropylamine	75-31-0	10,000	Oxirane, methyl-	75-56-9	10,000
Methacrylonitrile	126-98-7	10,000	Pentane	109-66-0	10,000
Methanamine	74-89-5	10,000	Peracetic acid	79-21-0	10,000
Methanamine, N,N-dimethyl-	75-50-3	10,000	Perchloromethyl mercaptan	594-42-3	10,000
Methanamine, N-methyl-	124-40-3	10,000	Phosgene	75-44-5	500
Methane	74-82-8	10,000	Phosphine	7803-51-2	5,000
Methane, chloro-	74-87-3	10,000	Phosphorous trichloride	7719-12-2	15,000
Methane, chloromethoxy-	107-30-2	5,000	Phosphorus oxychloride	10025-87-3	5,000
Methane, isocyanato-	624-83-9	10,000	Phosphorus trichloride	7719-12-2	15,000

<u>Regulated Substance</u>	<u>CAS No.</u>	<u>TQ*</u>	<u>Regulated Substance</u>	<u>CAS No.</u>	<u>TQ*</u>
Phosphoryl chloride	10025-87-3	5,000	Thiocyanic acid, methyl ester	556-64-9	20,000
Piperidine	110-89-4	15,000	Thiomethanol	74-93-1	10,000
Plumbane, tetramethyl-	75-74-1	10,000	Titanium chloride (TiCl ₄) (T-4)-	7550-45-0	2,500
Propadiene	463-49-0	10,000	Titanium tetrachloride	7550-45-0	2,500
Propane	74-98-6	10,000	Toluene diisocyanate		
Propane, 2,2-dimethyl-	463-82-1	10,000	(unspecified isomer)	26471-62-5	10,000
Propane, 2-chloro-	75-29-6	10,000	Toluene-2,4-diisocyanate	584-84-9	10,000
Propane, 2-methyl	75-28-5	10,000	Toluene-2,6-diisocyanate	91-08-7	10,000
Propanenitrile	107-12-0	10,000	Toluenediisocyanate (mixed isomers)	26471-62-5	10,000
Propanenitrile, 2-methyl-	78-82-0	20,000	Trichloromethanesulfonylchloride	594-42-3	10,000
Propene	115-07-1	10,000	Trichlorosilane	10025-78-2	10,000
Propionitrile	107-12-0	10,000	Trifluorochloroethylene	79-38-9	10,000
Propyl chloroformate	109-61-5	15,000	Trimethylamine	75-50-3	10,000
Propylene	115-07-1	10,000	Trimethylchlorosilane	75-77-4	10,000
Propylene oxide	75-56-9	10,000	Vinyl acetate	108-05-4	15,000
Propyleneimine	75-55-8	10,000	Vinyl acetate monomer	108-05-4	15,000
Propyne	74-99-7	10,000	Vinyl acetylene	689-97-4	10,000
Silane	7803-62-5	10,000	Vinyl chloride	75-01-4	10,000
Silane, chlorotrimethyl-	75-77-4	10,000	Vinyl ethyl ether	109-92-2	10,000
Silane, dichloro-	4109-96-0	10,000	Vinyl fluoride	75-02-5	10,000
Silane, dichlorodimethyl-	75-78-5	5,000	Vinyl methyl ether	107-25-5	10,000
Silane, tetramethyl-	75-76-3	10,000	Vinylidene chloride	75-35-4	10,000
Silane, trichloro-	10025-78-2	10,000	Vinylidene fluoride	75-38-7	10,000
Silane, trichloromethyl-	75-79-6	5,000			
Sulfur dioxide (anhydrous)	7446-09-5	5,000	Note: This list reflects the Environmental Protection Agency revisions through January of 1998.		
Sulfur fluoride (SF ₄), (T-4)-	7783-60-0	2,500			
Sulfur tetrafluoride	7783-60-0	2,500	* Threshold Quantity (TQ)		
Sulfur trioxide	7446-11-9	10,000			
Sulfuric acid (fuming)	8014-95-7	10,000			
Sulfuric acid, mixture with sulfur trioxide	8014-95-7	10,000			
Tetrafluoroethylene	116-14-3	10,000			
Tetramethyllead	75-74-1	10,000			
Tetramethylsilane	75-76-3	10,000			
Tetranitromethane	509-14-8	10,000			

Appendix B:

List of Air Quality Publications

General Air Pollution

SC Code of Laws, Title 48 - Environmental Protection and Conservation is necessary to maintain reasonable standards of purity of the air resources of the State consistent with public health, safety, and welfare of its citizens. It also promotes maximum employment, the industrial development of the State, the promulgation and protection of terrestrial and marine flora and fauna, and the protection of physical property and other resources.

SC DHEC Regulation 61- 62, Air Pollution Control Regulations and Standards are developed to facilitate the abatement, control, and prevention of air pollution.

SC Air Quality Annual Report is published annually to keep the public informed of statewide air quality, exceedances of ambient air quality standards, if any, progress in attainment or maintenance of standards, health hazards of air pollution, and air quality public participation.

Air Quality Lessons are a set of lessons for grades 2-10 on a variety of air issues. These lessons are also part of the “Action for a Cleaner Tomorrow” environmental curriculum supplement being distributed by the Division of Solid Waste planning and Recycling.

Air Pollution Activity Sheet is a one-page sheet listing the seven criteria pollutant characters (and toxic air pollutant) along with a brief description of each pollutant. The student is to determine the correct description for each pollutant.

Air Pollutant Character Bookmarks include seven different bookmarks. Each bookmark describes a different air pollutant and its source. The air pollutants are carbon monoxide, ozone, lead, toxic air pollutants, nitrogen dioxide, sulfur dioxide, asbestos and, particulate matter.

“Care About Air” Coloring Book is a nine-page coloring book that contains pictures and simple language illustrating the basic concepts of what causes air pollution and how we can keep the air clean.

Environmental Quality Control Bulletin Board Fact Sheet is a one-page sheet describing the electronic bulletin board and the information that may be obtained. The sheet also describes the steps for accessing the bulletin board.

Air Terms Fact Sheet is a one-page sheet with basic air terminology and definitions that can be used with audiences from middle school age to adults.

Acid Rain Fact Sheet is a sheet discussing the formation of acid rain and its impact on the environment.

Permitting Fact Sheet gives an overview on the basic steps for obtaining air construction and operating permits.

Ozone Fact Sheet is a one-page sheet discussing the impact of ground-level ozone and the current ozone situation in South Carolina.

Chlorofluorocarbons (CFCs) Fact Sheet is a one-page overview concerning the federal amendments and regulations for chlorofluorocarbons.

Open Burning: Learn before You Burn is a brochure describing the do’s and don’ts of open burning. The brochure also contains Open Burning Regulation 62.2, a list of healthy alternatives to open burning, and a listing of the Bureau of Air Quality’s district offices.

Small Business Assistance Program Fact Sheet is a one-page sheet describing how the program can help small businesses to comply with the Clean Air Act Amendments of 1990.

Accidental Release Prevention Program

Is your facility subject to Accidental Release Prevention Requirements [Section 112(r)] of the Clean Air Act? is a flyer that lists the chemicals [with Chemical Abstract Service (CAS) number and threshold quantity in pounds] that are regulated under accidental release prevention requirements of the Clean Air Act.

112 (r) Decision Tree assists facilities in determining if they are subject to the 112(r) program, and if subject, which program level each affected process must comply with.

Asbestos

Asbestos in Your Home! is a two-page flier that defines asbestos, its usage, the health effects from exposure, how to determine if it is in your home, and how to safely remove any asbestos materials.

Asbestos Fact Sheet is a one-page sheet containing basic information on what asbestos is and the health concerns regarding the removal of asbestos.

Asbestos: Information for Building Owners Fact Sheet provides basic information on the state and federal regulations for asbestos and its removal.

Regulatory Requirements for Renovations and Demolitions provides a summary of state and federal asbestos requirements for renovation and demolition activities for the regulated community.

South Carolina Asbestos Licensing provides a summary of training and licensing requirements for license applicants.

Regulatory Requirements For Building Inspection provides a summary for building inspectors and building owners of building inspection requirements and a summary of required sampling protocol.

Demolition Applicability Chart provides a chart for the regulated community to aid in understanding, which demolitions are regulated and which are not.

Guidelines for Homeowners with Damaged Asbestos Roofing or Siding provides recommended procedures for the handling of damaged asbestos roofing or siding materials.

Removal of Vinyl-Asbestos Flooring is a general regulatory information sheet concerning vinyl-asbestos flooring.

Removal of Asbestos Roofing Products is a general regulatory information sheet concerning asbestos-roofing products.

Removal of Asbestos Cement (A/C) Products is a general regulatory information sheet concerning asbestos cement products.

South Carolina Based Training Providers is a list of asbestos training providers with address and phone number information.

Contractor, Building Inspector Lists is a list of currently licensed asbestos abatement contractors and a list of currently licensed building inspectors/management planners which are printed monthly.

Asbestos Demolition and Renovation Civil Penalty (5/92) is a Federal document designed to promote equity in penalty assessments for asbestos demolitions and renovations.

Asbestos Violator Prioritization Checklist (3/92) is a Federal checklist containing guidance for ranking the seriousness of Federal asbestos violations.

Regulation 61-86.1 (June 28, 1996) sets the conditions for asbestos abatement licensure after an asbestos license has been denied. The guidance establishes condition(s) that a prospective asbestos abatement licensee who has previously been found in violation of established training and/or licensing requirements of the Regulation must meet in order to be considered for relicensure.

Southeastern States Standardized Asbestos Training Course Evaluation (6/96) establishes uniform reciprocal criteria for use in the on-site asbestos course audit/review process. This document is also part of Regulation 61-86.1.

Southern States Criteria for Evaluating Asbestos Instructor Qualifications (6/96) establishes uniform reciprocal criteria used in evaluating the written qualifications of the instructors who teach required asbestos training in specific disciplines. This document is also part of regulation 61-86.1.

Guidance Documents, Policies and Working Memoranda

Air Dispersion Modeling Requirements for SC DHEC Regulations 61-62, Memorandum (Hursey - 10/1/91), addresses the requirement for facilities to include an air Dispersion Modeling Analysis with all Construction Permit applications. The memorandum also addresses the requirement that modeling be submitted showing the facility meets all applicable standards before any operating permit is renewed (updated June 14, 1993, availability of Air Dispersion Modeling Guidelines).

Air Quality Modeling Guidelines (SC DHEC - August 1993), provides guidance for preparing an Air Dispersion Modeling Analysis and for complying with Regulation 62.5, Standard No. 8.

CEM Enforcement Plan helps ensure that sources with monitoring requirements are in continuous compliance with emission standards in addition to properly operating and maintaining their facilities and CEMs.

Stack Test Policy for Power Boilers is a guideline for placing steam load limits on power boilers based on their operating rate during stack tests.

Recommended Procedures for Performing Visible Emission Evaluations During Compliance Stack Tests describes how EPA Method 9 readings on visible emissions should be made during compliance tests required by permit and/or regulation.

Orsat Validation, Memorandum (Frick - 2/9/82), describes procedures for validating Orsat readings taken to quantify oxygen, carbon dioxide, and carbon monoxide concentrations in stack gases.

Exemption from Stack Testing for Boilers on “Standby,” Memorandum (Wood - 1/15/87), documents the Bureau of Air Quality’s criteria for exempting “standby” boilers from the requirement for periodic stack tests.

Counting fugitive emissions for major source determinations, Memorandum (Banks - 12/30/94), describes how to calculate the potential to emit for major source determinations (using fugitive emissions).

Maximum % Sulfur to use for #4 oil usage, Memorandum (Betterton - 1/9/95), describes the percentage of sulfur to use when making potential emissions determinations for #4 oil.

Part 70 Regulations (R.61-62.70) Title V Operating Permit Program governs the Title V operating permits program for the state of South Carolina.

Permit Source Test Conditions (2/9/81) lists permit conditions that define requirements for source testing.

Insignificant Activities for South Carolina's Title V Program describes insignificant activities under the Title V operating Permit Program.

Compilation of Air Pollutant Emission Factors, AP-42, Volume 1, 5th Edition (U.S. EPA - January, 1995), serves as the standard reference manual describing air pollutant emission generating activities, estimations of emissions related to activity levels, control methods and efficiencies, and default values when actual data are not available.

Fact Sheet on General Permitting for Fuel Combustion Operations gives a brief overview on the general permit requirements for facilities comprised of one or more fuel combustion sources approved by the Department.

Fact Sheet on General Permitting for Textile Greige Plants gives a brief overview on the general permit requirements for textile greige plants producing unfinished fabric.

Fact Sheet on General Permitting for Concrete Batch Plants gives a brief overview on the general permit requirements for concrete batch plants and/or concrete block plants.

Fact Sheet on General Permitting for Hot Mix Asphalt Plants gives a brief overview on the general permit requirements for hot mix asphalt plants.

Calculating Actual Emissions for Air Quality 1997 Minor Source Permit Fees is a set of instructions to assist minor sources in the calculation of their actual air emissions for the calendar year 1995.

Emission Estimate Guidelines for 1997 Minor Source Permit Fees (Facilities that did not operate in 1995) is a set of guidelines to calculate emission estimates for minor sources which did not operate in 1995.

Emission Inventory Section Policy and Procedure Manual (DRAFT) documents all policy decisions regarding emission estimation methodologies, quality control/quality assurance and federal data reporting.

Fact sheet on NESHAP for Shipbuilding and Ship Repair Facilities gives an overview on the handling of volatile organic compounds (VOCs) pursuant to Section 112c of the Clean Air Act, Shipbuilding and Ship Repair (Surface Coating).

Fact Sheet on Final Air Toxic Regulation for Wood Furniture Manufacturing Operations gives an overview on the EPA final rule to reduce air toxic emissions from wood manufacturing facilities.

Permit Penalty Policy Matrix Minimum Settlement Figures, EPA is a Federal document designed to promote equity in penalty assessments for

stationary sources.

Insignificant Activities for South Carolina's Title V Program describes insignificant activities under the Title V Operating Permit Program.

EPA New Source Review Workshop Manual (DRAFT) is a training document that guides permitting officials in implementing the new source review program.

Air Pollution Engineering Manual (AP-40), (1992) is a supplement to AP-42 and provides additional information about air pollution control.

AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, (EPA 450/4-90-003, March 1990) was formerly the primary emission factor tool for emission estimation, but has been largely replaced by the FIRE system described below. It is still sometimes used to locate more quickly Source Classification Codes (SCC) for manufacturing processes.

Factor Information Retrieval System (FIRE) is a software package that contains the most recent emission factor information available from the EPA.

AIR Chief CD-ROM contains all of the narrative in AP-42, emission factors in contained FIRE, and resources available from the California Air Resources Board, etc.

Tanks 2 is EPA software used to estimate volatile organic compounds emissions from storage tanks.

Appendix C: Promulgation & Delegation

Category 40 CFR Part 60 New Source Performance Standards	Subpart	Date EPA Promulgated	Date Delegated
Delegation for all NSPS promulgated between January 15, 1976 & January 29, 1981		1/29/81	3/17/81
General Provisions	A	8/11/93	3/16/94
Emission Guidelines and Compliance Times for Large Municipal Waste Combustors	Cb	8/25/97	pending
Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills	Cc	3/12/96	pending
Emission Guidelines and Compliance Times for Hospital/Medical/Infectious Waste Incinerator	Ce	9/15/97	pending
Fossil-Fuel Fired Steam Generators	D	12/31/71	3/3/92
Electric Utility Steam Generating Units (Commenced after September 18, 1978)	Da	6/11/79	3/3/92
Industrial Boilers	Db	11/25/86	1/24/89
Small Industrial-Commercial Institutional Steam Generators	Dc	11/15/95	5/8/96
Incinerators	E	12/23/71	3/3/92
Municipal Waste Combustors (Construction between 12/20/89 & 09/20/94)	Ea	2/11/71	3/3/92
Municipal Waste Combustors (construction commenced after 09/20/94)	Eb	12/19/95	9/19/96
Hospital/Medical/Infectious Waste	Ec	9/15/97	pending
Portland Cement Plants	F	12/23/71	1/23/90
Nitric Acid Plants	G	12/23/71	3/3/92
Sulfuric Acid Plants	H	12/23/71	3/3/92
Hot Mix Asphalt Facilities (Asphalt Concrete Plants)	I	3/8/74	3/3/92
Petroleum Refineries	J	3/15/78	3/26/82
Petroleum Refineries (except:60.105(a)(13)(iii) & 60.106(i)(12)	J	10/2/90	3/3/92
Storage Vessels for Petroleum Liquids (6/11/73–5/19/78)	K	3/8/74	3/3/92
Storage Vessels for Petroleum Liquids (5/18/78)	Ka	4/4/80	3/3/92
Storage Vessels for Petroleum Liquids (After 7/23/84)	Kb	4/8/87	7/23/87
Secondary Lead Smelters	L	3/8/74	3/3/92
Secondary Brass and Bronze Ingot Production Plants	M	3/8/74	3/3/92
Iron and Steel Plants	N	4/13/78	3/26/92
Secondary Emissions from Basic Oxygen Process Steel Facilities (01/20/83)	Na	1/2/86	3/3/92
Sewage Treatment Plants	O	10/6/88	2/3/94
Primary Copper Smelters	P	1/15/76	3/3/92
Primary Zinc Smelters	Q	1/15/76	3/3/92
Primary Lead Smelters	R	1/15/76	3/3/92
Primary Aluminum Reduction Plants	S	1/26/76	3/3/92

<u>Category 40 CFR Part 60 New Source Performance Standards</u>	<u>Subpart</u>	<u>Date EPA Promulgated</u>	<u>Date Delegated</u>
Phosphate Fertilizer Industry: Wet Process Phosphoric Acid Plants	T	8/6/75	3/3/92
Phosphate Fertilizer Industry: Superphosphoric Acid Plants	U	8/6/75	3/3/92
Phosphate Fertilizer Industry: Diammonium Phosphate Plants	V	8/6/75	3/3/92
Phosphate Fertilizer Industry: Triple Superphosphate Plants	W	8/6/75	3/3/92
Phosphate Fertilizer Industry: Granular Triple Superphosphate Storage	X	8/6/75	3/3/92
Phosphate Fertilizer Industry: Granular Triple Superphosphate (revision)	X	4/15/97	pending
Coal Preparation Plants	Y	1/15/76	3/3/92
Ferroalloy Production Facilities	Z	5/4/76	3/3/92
Steel Plants: Electric Arc Furnaces	AA	9/23/75	3/3/92
Steel Plants: Electric Arc Furnaces and Argon-Oxy Decarbon	AAa	10/31/84	3/3/92
Kraft Pulp Mills	BB	2/23/78	3/3/92
Glass Manufacturing Plants	CC	10/19/84	3/3/92
Grain Elevators	DD	8/5/78	3/3/92
Surface Coating of Metal Furniture	EE	10/29/82	4/6/84
Stationary Gas Turbine	GG	9/10/79	3/3/92
Lime Manufacturing Plants	HH	4/26/84	3/3/92
Organic Solvent Cleaners Greasers	JJ	6/11/80	9/9/94
Lead-Acid Battery Manufacturing Plants	KK	4/16/82	3/3/92
Metallic Mineral Processing Plants	LL	2/21/84	3/3/92
Automobile & Light Duty Truck Coating Operations	MM	7/29/82	10/11/94
Phosphate Rock Plants	NN	4/16/82	3/3/92
Ammonium Sulfate Manufacture	PP	11/12/80	3/3/92
Graphic Arts Industry: Publication Rotogravure Printing	QQ	11/8/82	4/28/83
Pressure Sensitive Tape & Label Surface Coating Operations	RR	10/18/83	5/10/84
Industrial Surface Coating: Large Appliances	SS	10/27/82	4/6/84
Metal Coil Surface Coating	TT	11/1/82	4/6/84
Asphalt Processing and Asphalt Roofing Manufacture	UU	8/6/82	3/3/92
Equipment Leaks of VOC in Synthetic Organic Chemical Manufacturing Industry (SOCMI)	VV	7/15/94	8/18/95
Beverage Can Surface Coating Industry	WW	8/25/83	5/10/84
Bulk Gasoline Terminals	XX	8/18/83	3/3/92
Residential Wood Heaters	AAA	2/26/88	pending
Rubber Tire Manufacturing Industry	BBB	9/15/87	1/23/90
VOC Emissions from the Polymer Manufacturing Industry	DDD	12/11/90	3/3/92

<u>Category 40 CFR Part 60 New Source Performance Standards</u>	<u>Subpart</u>	<u>Date EPA Promulgated</u>	<u>Date Delegated</u>
Rotogravure Printing and Coating of Flex Vinyl & Urethane	FFF	6/29/84	3/27/85
Equipment Leaks of VOC in Petroleum Refineries	GGG	5/30/84	3/27/85
Synthetic Fiber Production Facilities	HHH	4/5/84	5/10/84
VOC Emissions from SOCM I Air Oxidation Unit Process	III	6/29/90	8/7/90
Petroleum Dry Cleaners	JJJ	9/21/84	3/27/85
Onshore Natural Gas Processing VOC	KKK	6/24/85	2/18/86
Onshore Natural Gas Processing SO ₂	LLL	10/1/85	3/3/92
VOC Emissions from SOCM I Distillation Operations	NNN	6/29/90	11/27/95
Nonmetallic Mineral Processing Plants	OOO	8/1/85	3/3/92
Nonmetallic Mineral Processing Plants (Revision)	OOO	6/10/97	pending
Nonmetallic Mineral Processing Plant (Correction Revision)	OOO	11/26/97	pending
Wool Fiberglass Insulation	PPP	2/25/85	3/3/92
VOC Emissions from Petroleum Refinery Wastewater Systems	QQQ	7/15/94	8/18/95
VOC Emissions from SOCM I Reactor Processes	RRR	8/31/93	2/2/94
Magnetic Tape Coating Facilities	SSS	10/3/88	1/24/89
Plastic Parts for Business Machines Coating	TTT	1/29/88	1/23/90
Calciners & Dryers in Mineral Industries	UUU	9/28/92	3/8/93
Polymeric Coating of Supporting Substrates Facilities	VVV	9/11/89	1/23/90
Municipal Solid Waste Landfills	WWW	3/12/96	9/19/96

<u>Category 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants</u>	<u>Subpart</u>	<u>Date EPA Promulgated</u>	<u>Date Delegated</u>
General Provisions	A		3/16/94
Radon Emissions from Underground Uranium Mines	B	4/17/85	7/26/97
Beryllium	C	4/6/73	1/23/90
Beryllium Rocket Motor Firing	D	4/6/73	1/23/90
Mercury	E	4/6/73	1/23/90
Vinyl Chloride	F	10/21/76	7/23/87
Radionuclide Emissions from Department of Energy Facilities	H	2/6/85	7/26/95
Radionuclide Emissions from Facilities Licensed by Nuclear Regulatory Commission & Federal Facilities	I	2/6/85	N/A
Equipment Leaks (Fugitive Emission Sources) of Benzene	J	6/6/84	1/23/90
Radionuclide Emissions from elemental Phosphorus Plants	K	2/6/85	7/26/95
Benzene Emissions from Coke By-Product Recovery Plants	L	2/6/85	1/23/90
Asbestos	M	4/6/73	1/25/91
Asbestos (Revised)	M	11/20/90	pending
Inorganic Arsenic Emissions from Glass Manufacturing Plants	N	8/4/86	1/23/90
<u>Category 40 CFR Part 63 Maximum Achievable Control Technology</u>	<u>Subpart</u>	<u>Date EPA Promulgated</u>	
General Provisions	A	3/16/94	
Constructed, or Reconstructed Major Sources	B	12/27/96	
Compliance Extensions for Early Reductions	A,B,C	12/29/92	
Federal Operating Permits/Early Reductions	D	11/21/94	
Approval of State Programs and Delegation of Federal Authorities	E	11/26/93	
Synthetic Organic Chemical Manufacturing Industry	F	pending	
Synthetic Organic Chemical Manufacturing Industry	F	1/17/97	
Hazardous Organic National Emission Standard for Hazardous Air Pollutants (NESHAP)	G	12/12/95	
Hazardous Organic NESHAP	H	2/29/96	
Hazardous Organic NESHAP	I	2/29/96	
Coke Ovens	L	10/27/93	
Perchloroethylene Dry Cleaning Facilities	M	9/19/96	
Hard and Decorative Chromium Anodizing Tanks	N	8/11/97	
Chromium Electroplating and Chromium Anodizing	N	6/27/95	
Ethylene Oxide Emissions Standards for Sterilization Facilities	O	12/9/97	
Industrial Cooling Towers	Q	9/8/94	

<u>Category 40 CFR Part 63 Maximum Achievable Control Technology</u>	<u>Subpart</u>	<u>Date EPA Promulgated</u>
Gasoline Distribution (Stage I)	R	2/29/96
Halogenated Solvent Cleaning	T	12/2/94
Halogenated Solvent Cleaning	T	6/5/95
Group I Polymers & Resins	U	7/15/97
Epoxy Resins & Non-Nylon Polyamides Product	W	3/8/95
Secondary Lead Smelting	X	6/13/97
Marine Tank Loading Operations	Y	9/19/95
Hazardous Air Pollutants-Phosphoric Acid Manufacturing and Phosphate Fertilizers Production	AA	proposed
Petroleum Refineries	CC	6/12/96
Off-Site Waste and Recovery Operations	DD	7/1/96
Magnet Tape Manufacturing	EE	12/15/94
Aerospace Manufacturing Rework Facilities	GG	12/17/96
Oil & Natural Gas Production	HH	proposed
Shipbuilding & Ship Repair (Surface Coating)	II	6/18/96
Shipbuilding & Ship Repair (Surface Coating)	CTG**	8/27/96
Wood Furniture Manufacturing	JJ	6/9/97
Wood Furniture Manufacturing	CTG**	5/20/96
Printing and Publishing Industry	KK	5/30/96
Primary Aluminum Reduction Plants	LL	10/7/97
Steel Pickling Facilities - Hydrochloric Acid Process	CCC	proposed
Mineral Wool Production	DDD	proposed
Pharmaceutical Production	GGG	proposed
Flexible Polyurethane Foam Production	III	proposed
Group IV Polymers & Resins	JJJ	6/6/97
Pesticide Active Ingredient Production	MMM	proposed
Wool Fiberglass Manufacturing	NNN	proposed
Polyether Polyols Production	PPP	proposed
Pulp and Paper Production		proposed

** Note: South Carolina received delegation of all previous MACT standards and all future MACT standards through the Title V Operating Permit program approval on July 26, 1995.*

***CTG - Control Techniques Guidelines*

Appendix D:

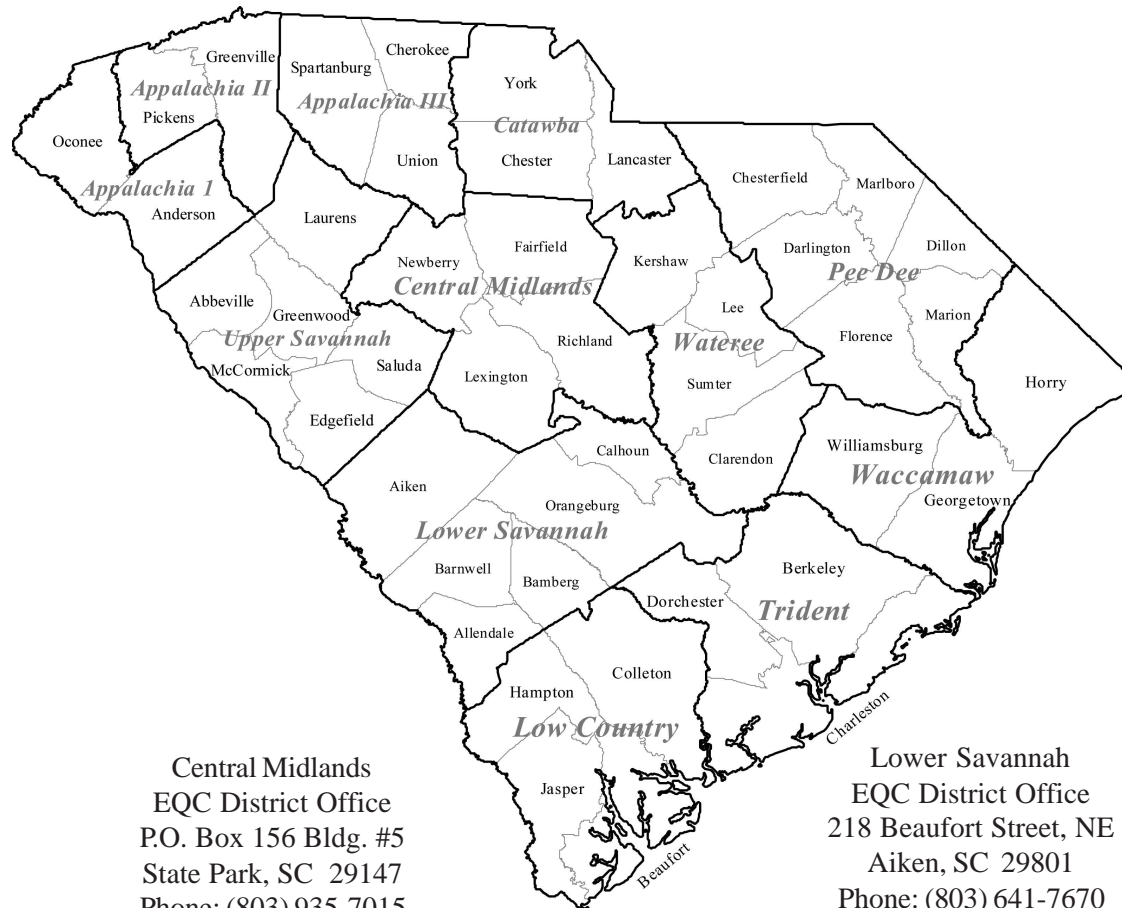
State Maps - EQC Districts, Ambient Air Monitoring Network

Appalachia I
EQC District Office
2404 N. Main St
Anderson, SC 29621
Phone: (864) 260-5569
Fax: (864) 260-4855

Appalachia II
EQC District Office
301 University Ridge
Suite 5800
Greenville, SC 29601
Phone: (864) 241-1090
Fax: (864) 241-1092

Appalachia III
EQC District Office
PO Box 8778
975 N. Church St.
Spartanburg, SC 29305
Phone: (864) 896-3800
Fax: (864) 596-2192

Catawba
EQC District Office
PO Box 100
2475 DHEC Rd.
Lancaster, SC 29720
Phone: (803) 285-7461
Fax: (803) 285-5594



Central Midlands
EQC District Office
P.O. Box 156 Bldg. #5
State Park, SC 29147
Phone: (803) 935-7015
Fax: (803) 935-6724

Low Country
EQC District Office
1313 13th Street
Port Royal, SC 29935
Phone: (843) 522-9097
Fax: (843) 522-8463

Lower Savannah
EQC District Office
218 Beaufort Street, NE
Aiken, SC 29801
Phone: (803) 641-7670
Fax: (803) 641-7675

Pee Dee
EQC District Office
145 E. Cheves Street
Florence, SC 29506
Phone: (843) 661-4825
Fax: (843) 661-4858

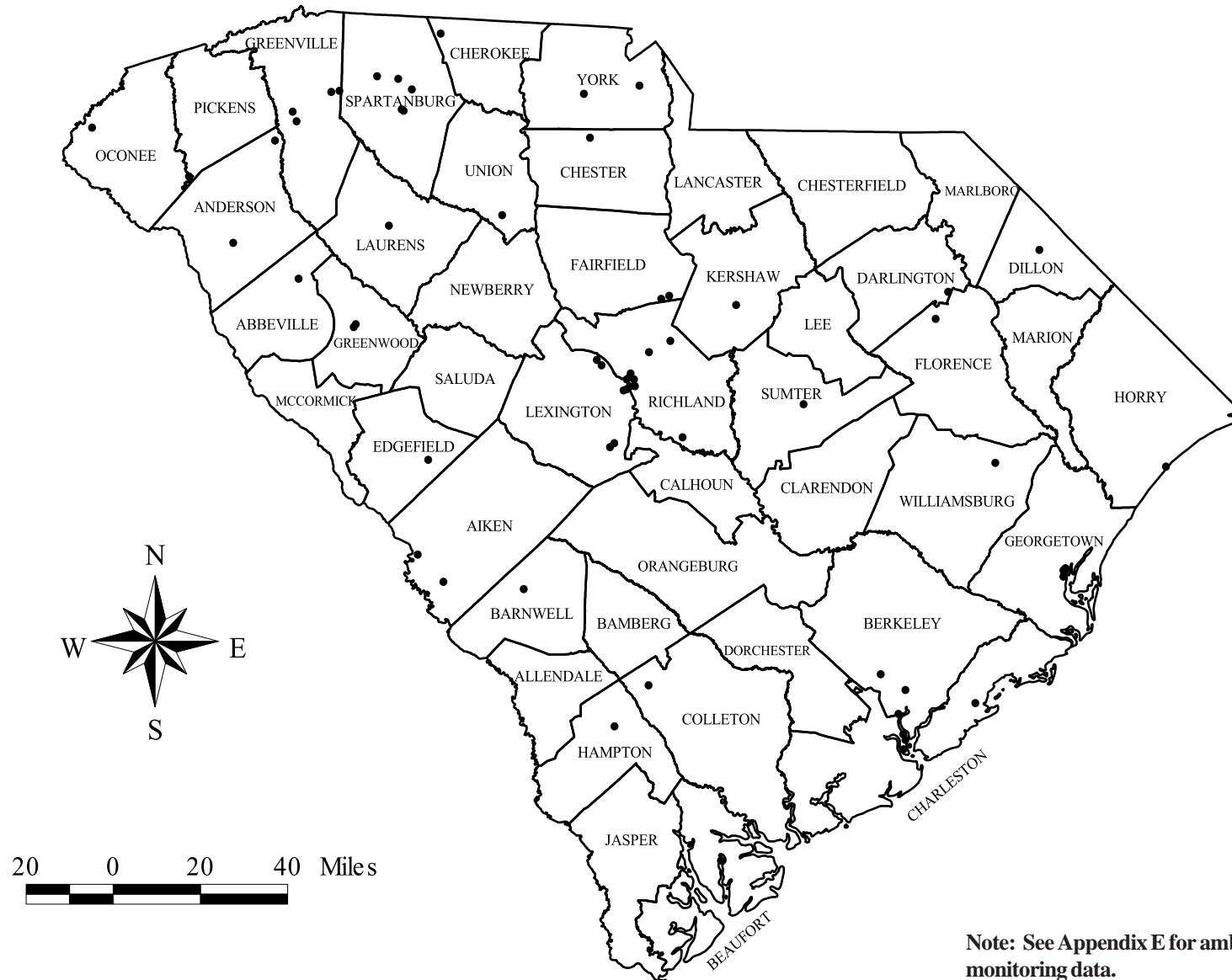
Trident
EQC District Office
2470 Air Park Rd.
Charleston, SC 29406
Phone: (843) 740-1590
Fax: (843) 740-1595

Upper Savannah
EQC District Office
613 South Main Street
Greenwood, SC 29646
Phone: (864) 223-0333
Fax: (864) 223-6935

Waccamaw
EQC District Office
1705 Oak St. Plaza, Suite 2
Myrtle Beach, SC 29577
Phone: (843) 448-1902
Fax: (843) 946-9390

Wateree
EQC District Office
P.O. Box 1628
105 N. Magnolia Street
Sumter, SC 29151
Phone: (803) 778-1513
Fax: (803) 773-6366

South Carolina Ambient Air Monitoring Network



Acid Rain Monitors



- [1] Due West
- [2] Barnwell CMS
- [3] Cape Romain Wildlife Refuge
- [4] Cowpens Nat'l Battleground

- [5] Round Mt. Fire Tower (Longcreek)
- [6] Parklane-State Park Health Ctr.
- [7] Congaree Swamp Nat'l Monument
- [8] Delta

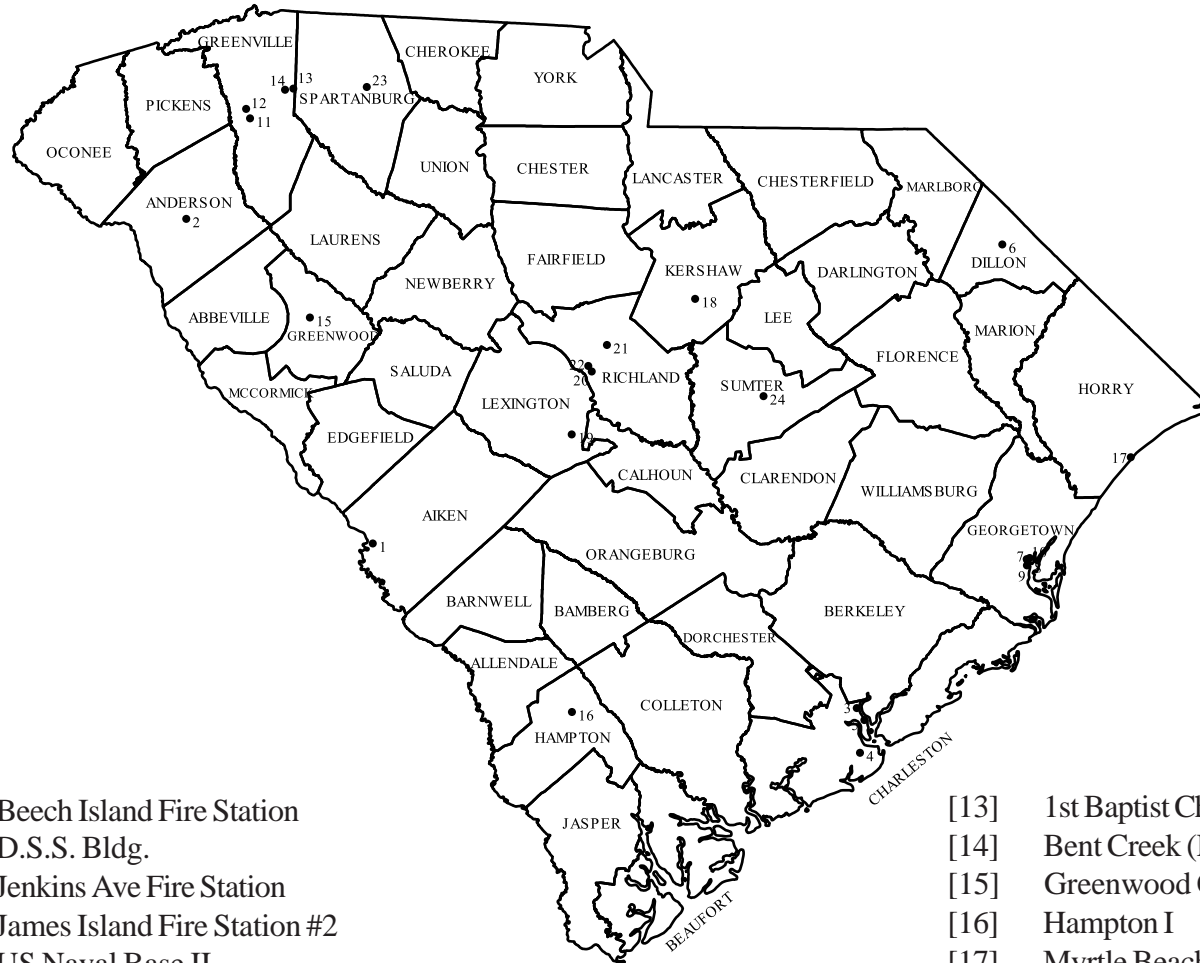
Nitrogen Dioxide (NO₂) Monitors



- [1] Jackson Middle School
- [2] Barnwell CMS
- [3] Jenkins Ave. Fire Station
- [4] Cape Romain Wildlife Refuge

- [5] Greenville Health Department
- [6] Parklane-State Park Health Ctr.
- [7] Congaree Swamp Nat'l Monument

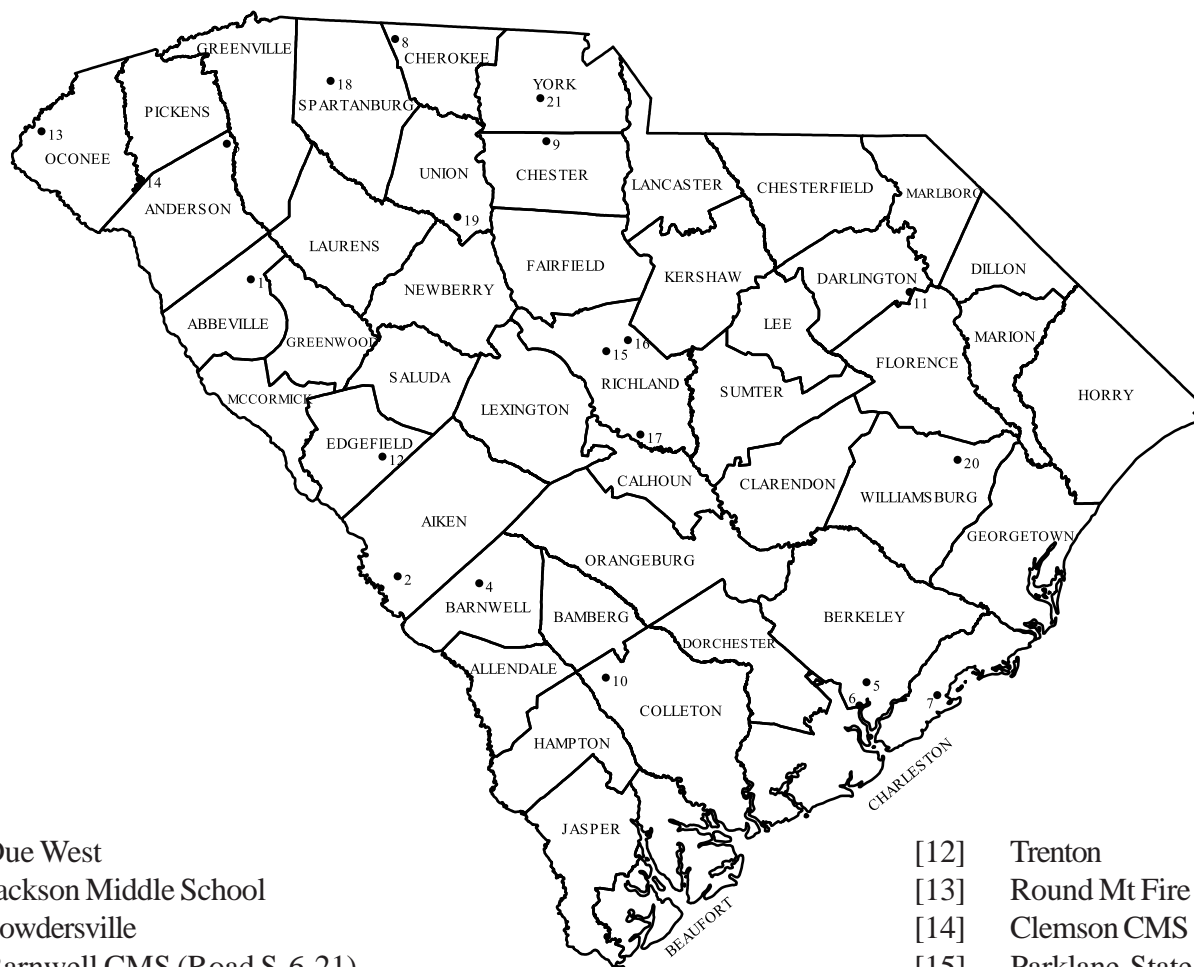
Lead (Pb) Monitors



- [1] Beech Island Fire Station
- [2] D.S.S. Bldg.
- [3] Jenkins Ave Fire Station
- [4] James Island Fire Station #2
- [5] US Naval Base II
- [6] City-County Office Bldg.
- [7] Howard High School
- [8] Georgetown CMS
- [9] Maryville Power Sub Station
- [10] Winyah
- [11] Greenville Health Dept.
- [12] Parker Fire Station

- [13] 1st Baptist Church Annex
- [14] Bent Creek (Exide)
- [15] Greenwood Cty DSS
- [16] Hampton I
- [17] Myrtle Beach EQC Office
- [18] Kershaw Cty Health Dept.
- [19] Spires (Gaston)
- [20] SCPPPS
- [21] Parklane - State Park Health Ctr
- [22] DHEC Parking Lot
- [23] Spartanburg City Hall
- [24] Rock Hill Water Filter Plant

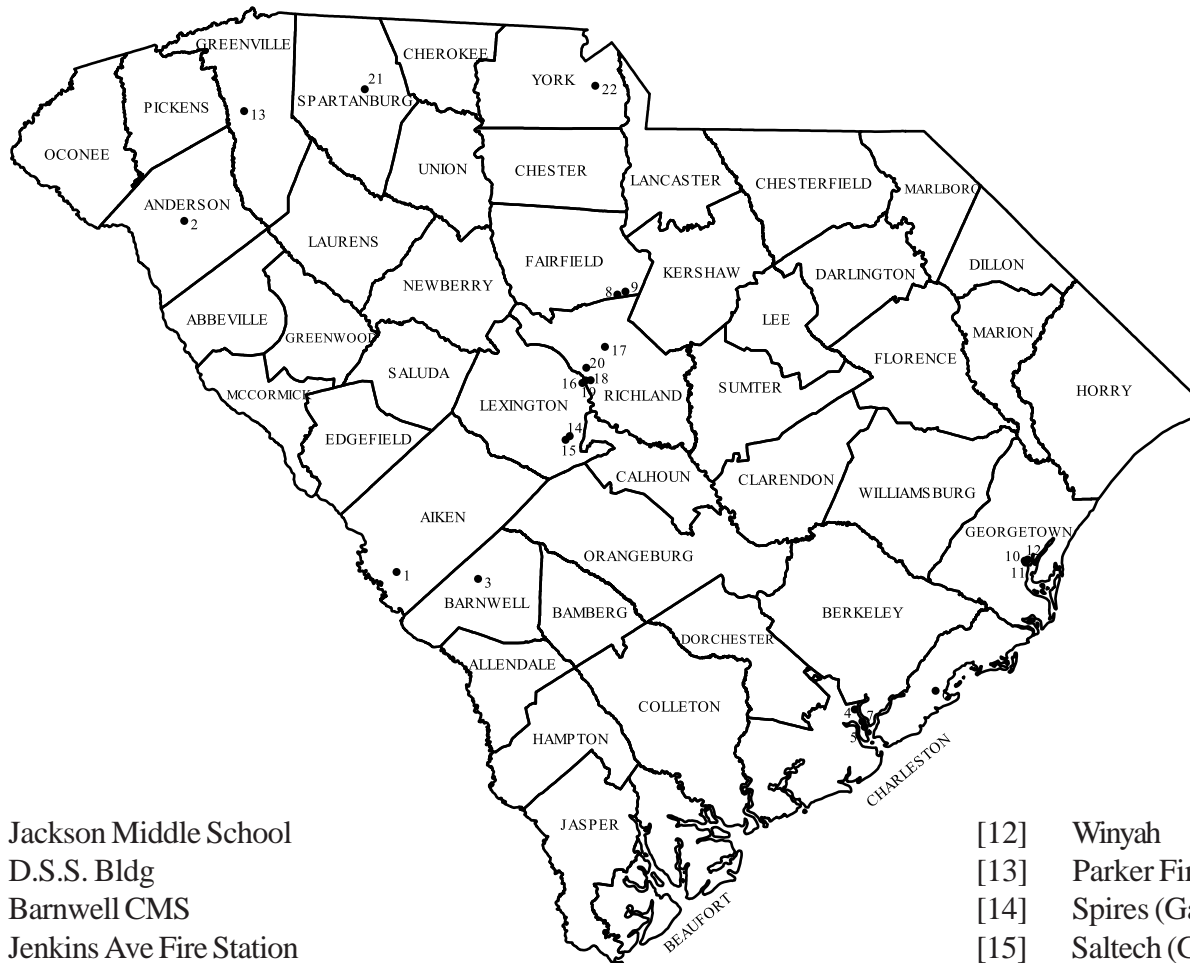
Ozone (O₃) Monitors



- [1] Due West
- [2] Jackson Middle School
- [3] Powdersville
- [4] Barnwell CMS (Road S-6-21)
- [5] Bushy Park Pump Station
- [6] US Army Reserve #1
- [7] Cape Romain Wildlife Refuge
- [8] Cowpens Nat'l Battle Ground
- [9] Chester Airport
- [10] Ashton
- [11] Pee Dee Exp Station-Field

- [12] Trenton
- [13] Round Mt Fire Tower (Longcreek)
- [14] Clemson CMS (Clemson University)
- [15] Parklane-State Park Health Ctr
- [16] Sandhill
- [17] Congaree Swamp Nat'l Monument
- [18] North Spartanburg Fire Station #2
- [19] Delta
- [20] Indiantown
- [21] York CMS (New)

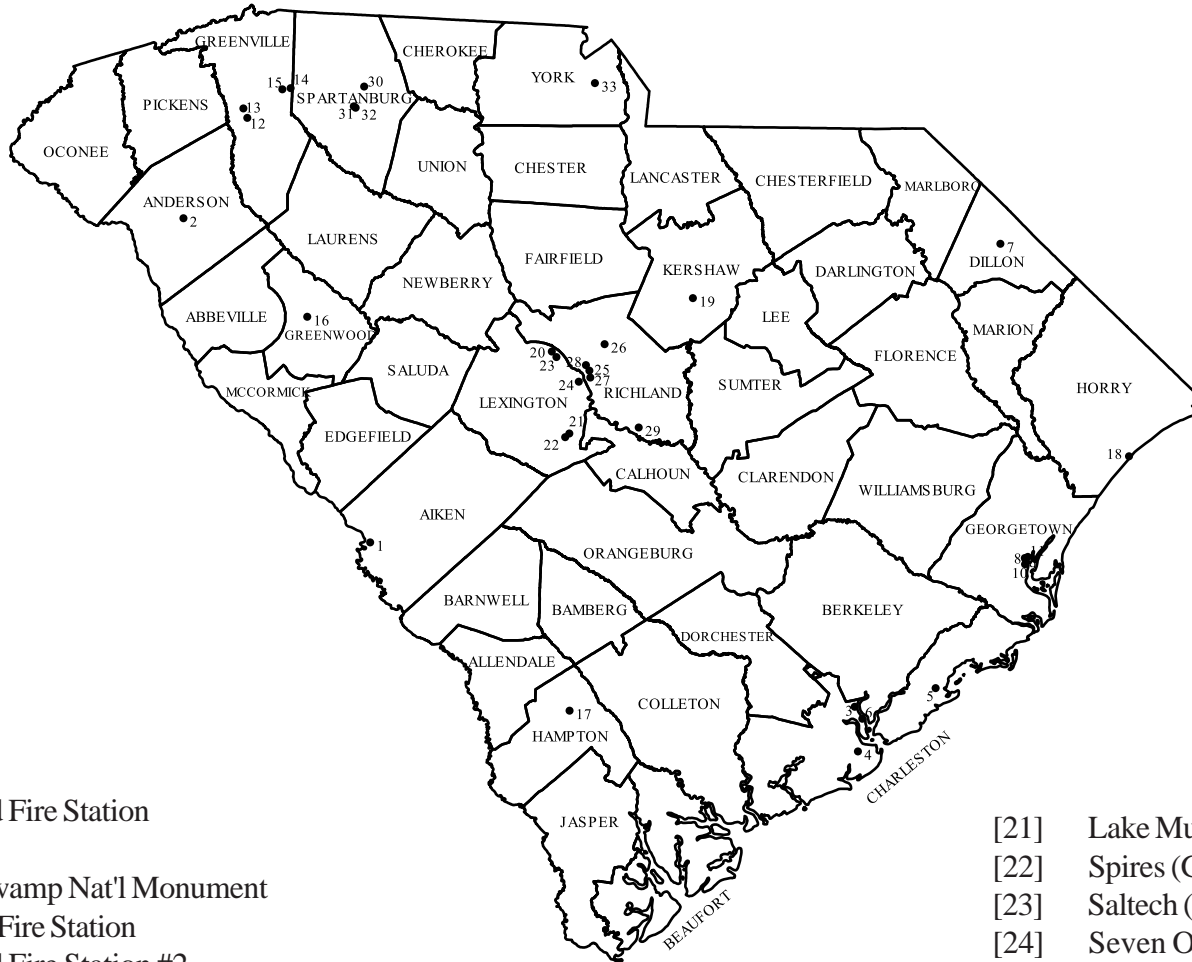
Particulate Matter (PM₁₀) Monitors



- [1] Jackson Middle School
- [2] D.S.S. Bldg
- [3] Barnwell CMS
- [4] Jenkins Ave Fire Station
- [5] Exxon Dock
- [6] Cape Romain Wildlife Refuge
- [7] US Naval Base II
- [8] Ridgeway #1
- [9] Ridgeway #2
- [10] Howard High School
- [11] Georgetown CMS

- [12] Winyah
- [13] Parker Fire Station
- [14] Spires (Gaston)
- [15] Saltech (Gaston-Fallaw)
- [16] Cayce CMS
- [17] Parklane-State Park Health Ctr
- [18] Enright (Rex) Athletic Ctr (USC)
- [19] Olympia
- [20] DHEC Parking Lot
- [21] Spartanburg City Hall
- [22] Rock Hill Water Filter Plant

Total Suspended Particulate (TSP) Monitors



- [1] Beech Island Fire Station
- [2] D.S.S. Bldg.
- [3] Congaree Swamp Nat'l Monument
- [4] Jenkins Ave Fire Station
- [5] James Island Fire Station #2
- [6] Cape Romain Wildlife Refuge
- [7] US Naval Base II
- [8] City-County Office Bldg.
- [9] Howard High School
- [10] Georgetown CMS
- [11] Maryville Power Sub Station
- [12] Winyah
- [13] Greenville Health Dept.

- [14] Parker Fire Station
- [15] 1st Baptist Church Annex
- [16] Bent Creek (Exide)
- [17] Greenwood Cty DSS
- [18] Hampton I
- [19] Myrtle Beach EQC Office
- [20] Kershaw Cty Health Dept.

- [21] Lake Murray Technology Ctr
- [22] Spires (Gaston)
- [23] Saltech (Gaston-Fallow)
- [24] Seven Oaks Rec Ctr
- [25] Cayce Fire Station
- [26] SCPPPS
- [27] Parklane - State Park Health Ctr
- [28] Enright (Rex) Athletic Ctr (USC)
- [29] DHEC Parking Lot
- [30] Spartanburg City Hall
- [31] Roebuck-Cromer
- [32] Roebuck-Pecan
- [33] Rock Hill Water Filter Plant

Carbon Monoxide (CO) Monitor Locations



- [1] Ashe Street
- [2] Greenville Health Dept.
- [3] Wardlaw

Sulfur Dioxide (SO₂) Monitors



- [1] Jackson Middle School
- [2] Barnwell CMS (Road S-6-21)
- [3] Jenkins Ave Fire Station
- [4] Cape Romain Wildlife Refuge
- [5] Geortown CMS
- [6] Greenville Health Dept.

- [7] Seven Oaks Recreational Ctr
- [8] Round Mt Fire Tower (Longcreek)
- [9] Parklane-State Park Health Ctr
- [10] DHEC Parking Lot
- [11] Congaree Swamp Nat'l Monument

Appendix E:

Ambient Air Quality Monitoring Network Data

Acid Rain

Site ID	County	UTM-N	UTM-E	Site Name	City	Annual Average Weighted pH									
						1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
45-001-0001	Abbeville	3798885	372440	Due West	None	N/A	N/A	N/A	4.27	4.44	4.34	4.49	4.57	4.48	4.56
45-011-0001	Barnwell	3686689	456659	Barnwell CMS	None	N/A	4.47	4.40	4.35	4.39	4.38	4.60	4.63	4.52	4.61
45-019-0046	Charleston	3645423	625453	Cape Romain Wildlife Refuge	None	4.39	4.32	N/A	4.37	4.43	4.06	4.69	4.46	4.57	4.57
45-021-0002	Cherokee	3887596	425589	Cowpens Nat'l Battle Ground	None	N/A	4.37	4.46	4.27	4.30	4.26	4.35	4.45	4.37	4.41
45-073-0001	Oconee	3853517	295290	Round Mt Fire Tower (Longcreek)	None	4.35	4.44	4.38	4.27	4.42	4.28	4.51	4.60	4.43	4.53
45-079-0007	Richland	3772362	503461	Parklane-State Park Health Ctr	Columbia	4.28	4.33	4.38	4.30	4.28	4.28	4.54	4.49	4.53	N/A
45-079-1006	Richland	3741586	516032	Congaree Swamp Nat'l Monument	None	4.35	4.36	4.36	4.33	4.44	4.26	4.59	4.58	4.52	4.47
45-087-0001	Union	3821894	448566	Delta	None	4.12	4.38	4.36	4.36	4.39	4.33	4.54	4.52	4.51	4.50

Nitrogen Dioxide (NO₂) [Air quality standard = 0.053 ppm (100 µg/m³)]

Site ID	County	UTM-N	UTM-E	Site Name	City	Arithmetic Mean			1st 1-hr Max.		2nd 1-hr Max.	
						ppm	µg/m³	Observations	ppm	µg/m³	ppm	µg/m³
45-003-0003	Aiken	3689293	426589	Jackson Middle School	None	0.005	9.40	8418	0.042	78.96	0.041	77.08
45-011-0001	Barnwell	3686689	456659	Barnwell CMS (Road S-6-21)	None	0.004	7.52	7582	0.027	50.76	0.025	47.00
45-019-0003	Charleston	3638530	595616	Jenkins Ave Fire Station	N. Charleston	0.011	20.68	8298	0.063	118.44	0.059	110.92
45-019-0046	Charleston	3645423	625453	Cape Romain Wildlife Refuge	None	0.004	7.52	7940	0.033	62.04	0.031	58.28
45-045-0008	Greenville	3855853	371711	Greenville Health Dept	Greenville	0.017	31.96	8278	0.067	125.96	0.067	125.96
45-079-0007	Richland	3772362	503461	Parklane - State Park Health Ctr	Columbia	0.011	20.68	7983	0.089	167.32	0.074	139.12
45-079-0007	Richland	3772362	503461	Parklane - State Park Health Ctr**	Columbia	0.009*	16.92*	2868	0.076	142.88	0.073	137.24
45-079-1006	Richland	3741586	516032	Congaree Swamp Nat'l Monument	None	0.004	7.52	8064	0.032	60.16	0.032	60.16

* Indicates that there is not enough data to calculate concentrations relative to the standard.

** Temporary site used during the Heritage Building construction.

Lead (Pb) - $\mu\text{g}/\text{m}^3$
[Air quality standard = $1.5 \mu\text{g}/\text{m}^3$]

<u>Site ID</u>	<u>County</u>	<u>UTM-N</u>	<u>UTM-E</u>	<u>Site Name</u>	<u>City</u>	<u>1st Quarter</u>		<u>2nd Quarter</u>		<u>3rd Quarter</u>		<u>4th Quarter</u>	
						<u>Obsv.</u>	<u>Arth. Mean</u>	<u>Obsv.</u>	<u>Arth. Mean</u>	<u>Obsv.</u>	<u>Arth. Mean</u>	<u>Obsv.</u>	<u>Arth. Mean</u>
45-003-1001	Aiken	3699184	417032	Beech Island Fire Station	None	14	0.00	15	0.00	12	0.01	14	0.01
45-007-0001	Anderson	3818862	348235	D.S.S. Bldg.	Anderson	6	0.01*	7	0.00*	N/A	N/A	N/A	N/A
45-019-0003	Charleston	3638530	595616	Jenkins Ave Fire Station	N. Charleston	15	0.01	14	0.01	12	0.01	16	0.01
45-019-0037	Charleston	3622064	596804	James Island Fire Station #2	None	8	0.00*	15	0.00	14	0.00	15	0.01
45-019-0047	Charleston	3634161	598429	US Naval Base II	N. Charleston	15	0.01	15	0.01	15	0.01	16	0.01
45-033-0001	Dillion	3809381	649333	City-County Office Bldg.	Dillon	15	0.01	15	0.01	15	0.01	15	0.01
45-043-0002	Georgetown	3693466	658374	Howard High School	Georgetown	10	0.01*	11	0.01*	13	0.02	14	0.01
45-043-0006	Georgetown	3692719	658700	Georgetown CMS	Georgetown	14	0.01	14	0.01	12	0.01	14	0.01
45-043-0007	Georgetown	3691150	658390	Maryville Power Sub Station	Georgetown	13	0.00	15	0.00	14	0.01	15	0.00
45-043-0009	Georgetown	3693835	659450	Winyah	Georgetown	14	0.02	14	0.01	15	0.01	16	0.01
45-045-0008	Greenville	3855853	371711	Greenville Health Dept.	Greenville	15	0.01	10	0.01*	14	0.01	15	0.01
45-045-1002	Greenville	3859360	370265	Parker Fire Station	Greenville	15	0.01	15	0.01	15	0.01	15	0.01
45-045-2002	Greenville	3866843	387695	1st Baptist Church Annex	Greer	15	0.01	15	0.00	13	0.01	14	0.00
45-045-8001	Greenville	3866460	384647	Bent Creek (Exide)	None	15	0.00	15	0.01	11	0.01*	10	0.02*
45-047-0001	Greenwood	3782434	393798	Greenwood Cty DSS	Greenwood	15	0.02	15	0.02	12	0.01	16	0.01
45-049-0001	Hampton	3637089	490541	Hampton I	Hampton	13	0.00	10	0.00*	10	0.01*	14	0.00
45-051-0002	Horry	3731000	696714	Myrtle Beach EQC Office	Myrtle Beach	12	0.00	14	0.00	15	0.01	16	0.00
45-055-0001	Kershaw	3789381	536017	Kershaw Cty Health Dept.	Camden	13	0.00	13	0.00	14	0.01	15	0.00
45-063-0004	Lexington	3739417	490456	Spires (Gaston)	None	15	0.00	14	0.00	15	0.00	15	0.00
45-079-0006	Richland	3762555	497833	SCPPPS	Columbia	14	0.00	15	0.00	15	0.01	11	0.01*
45-079-0007	Richland	3772362	503461	Parklane-State Park Hlth Ctr	Columbia	14	0.00	8	0.00*	10	0.01*	14	0.00
45-079-1003	Richland	3764661	496637	DHEC Parking Lot	Columbia	15	0.00	12	0.00	15	0.01	16	0.01
45-083-0001	Spartanburg	3867430	414832	Spartanburg City Hall	Spartanburg	11	0.00*	11	0.00*	6	0.01*	11	0.00*
45-091-0005	York	3753500	561200	Rock Hill Water Filter Plant	Rock Hill	9	0.01*	11	0.00*	13	0.01	11	0.01*

* Indicates that there is not enough data to calculate concentrations relative to the standard.

Ozone (O₃)
[Air quality standard = 0.12 ppm (235 µg/m³)]

Site ID	County	Site Name	UTM-N	UTM-E	City	Obsv.	<u>1st 1-hr Max.</u>		<u>2nd 1-hr Max.</u>		<u>3rd 1-hr Max.</u>		<u>4th 1-hr Max.</u>	
							ppm	µg/m ³	ppm	µg/m ³	ppm	µg/m ³	ppm	µg/m ³
45-001-0001	Abbeville	Due West	3798885	372440	None	191	0.099	194.04	0.090	176.40	0.090	176.40	0.090	176.40
45-003-0003	Aiken	Jackson Middle School	3689293	426589	None	216	0.106	207.76	0.104	203.84	0.101	197.96	0.098	192.08
45-007-0003	Anderson	Powdersville	3848898	363608	None	362	0.104	203.84	0.100	196.00	0.100	196.00	0.098	192.08
45-011-0001	Barnwell	Barnwell CMS (Road S-6-21)	3686689	456659	None	276	0.110	215.60	0.108	211.68	0.098	192.08	0.098	192.08
45-015-0002	Berkeley	Bushy Park Pump Station	3650164	599329	None	324	0.094	184.24	0.090	176.40	0.089	174.44	0.087	170.52
45-019-0042	Charleston	US Army Reserve #1	3641584	596722	None	320	0.079	154.84	0.076	148.96	0.071	139.16	0.070	137.20
45-019-0046	Charleston	Cape Romain Wildlife Refuge	3645423	625453	None	343	0.116	227.36	0.102	199.92	0.096	188.16	0.089	174.44
45-021-0002	Cherokee	Cowpens Nat'l Battle Ground	3887596	425589	None	232	0.108	211.68	0.104	203.84	0.104	203.84	0.102	199.92
45-023-0002	Chester	Chester Airport	3849891	481347	None	226	0.111	217.56	0.107	209.72	0.104	203.84	0.101	197.96
45-029-0002	Colleton	Ashton	3651905	503275	None	246	0.092	180.32	0.087	170.52	0.087	170.52	0.083	162.68
45-031-0003	Darlington	Pee Dee Exp Station-Field	3794195	615260	None	363	0.099	194.04	0.096	188.16	0.094	184.24	0.091	178.36
45-037-0001	Edgefield	Trenton	3733439	420912	None	359	0.099	194.04	0.093	182.28	0.090	176.40	0.086	168.56
45-073-0001	Oconee	Round Mt Fire Tower (Longcreek)	3853517	295290	None	322	0.096	188.16	0.090	176.40	0.089	174.44	0.089	174.44
45-077-0002	Pickens	Clemson CMS (Clemson University)	3835956	331490	Clemson	216	0.980	1920.80	0.097	190.12	0.093	182.28	0.092	180.32
45-079-0007	Richland	Parklane-State Park Health Ctr	3772362	503461	Columbia	314	0.112	219.52	0.109	213.64	0.108	211.68	0.107	209.72
45-079-0007	Richland	Parklane-State Park Health Ctr**	3772362	503461	Columbia	188	0.111	217.56	0.110	215.60	0.107	209.72	0.104	203.84
45-079-1002	Richland	Sandhill	3776454	511417	None	360	0.114	223.44	0.106	207.76	0.099	194.04	0.099	194.04
45-079-1006	Richland	Congaree Swamp Nat'l Monument	3741586	516032	None	186	0.098	192.08	0.088	172.48	0.088	172.48	0.085	166.60
45-083-0009	Spartanburg	North Spartanburg Fire Station #2	3872106	401800	None	355	0.120	235.20	0.107	209.72	0.105	205.80	0.104	203.84
45-087-0001	Union	Delta	3821894	448566	None	357	0.098	192.08	0.098	192.08	0.093	182.28	0.092	180.32
45-089-0001	Williamsburg	Indiantown	3732297	632929	None	213	0.086	168.56	0.084	164.64	0.078	152.88	0.078	152.88
45-091-0006	York	York CMS (New)	3865736	479125	None	295	0.108	211.68	0.098	192.08	0.095	186.20	0.090	176.40

** Temporary site used during the Heritage Building construction.

Particulate Matter (PM₁₀) - µg/m³
[Air quality standard = 50 µg/m³-annual, 150µg/m³-24hr]

<u>Site ID</u>	<u>County</u>	<u>UTM-N</u>	<u>UTM-E</u>	<u>Site Name</u>	<u>City</u>	<u>Arth. Mean</u>	<u>Obsv.</u>	<u>1st Max.</u>	<u>2nd Max.</u>	<u>3rd Max.</u>	<u>4th Max.</u>	<u>>150</u>
45-003-0003	Aiken	3689293	426589	Jackson Middle School	None	21	55	46	45	39	37	0.00
45-007-0001	Anderson	3818862	348235	D.S.S. Bldg	Anderson	19*	18	40	31	28	23	0.00
45-011-0001	Barnwell	3686689	456659	Barnwell CMS	None	19	53	62	44	38	38	0.00
45-019-0003	Charleston	3638530	595616	Jenkins Ave Fire Station	N.Charleston	20	338	48	47	46	46	0.00
45-019-0019	Charleston	3632111	599308	Exxon Dock	N.Charleston	18?	38	46	39	34	30	0.00
45-019-0046	Charleston	3645423	625453	Camp Romain Wildlife Refuge	None	17*	55	34	31	30	30	0.00
45-019-0047	Charleston	3634161	598429	US Naval Base II	N.Charleston	22	56	49	49	37	35	0.00
45-039-8001	Fairfield	3791641	508054	Ridgeway #1	None	20*	50	47	41	40	33	0.00
45-039-8002	Fairfield	3792763	511021	Ridgeway #2	None	27	55	65	53	51	46	0.00
45-043-0002	Georgetown	3693466	658374	Howard High School	Georgetown	28	54	63	51	49	44	0.00
45-043-0006	Georgetown	3692719	658700	Georgetown CMS	Georgetown	37	364	103	98	97	78	0.00
45-043-0009	Georgetown	3693835	659450	Winyah	Georgetown	27	54	59	48	47	40	0.00
45-045-1002	Greenville	3859360	370265	Parker Fire Station	Greenville	24*	272	57	53	51	51	0.00
45-063-0004	Lexington	3739417	490456	Spires (Gaston)	None	21	59	47	45	40	37	0.00
45-063-0005	Lexington	3737992	488895	Saltech (Gaston-Fallow)	None	28	298	172	118	112	105	1.30
45-063-0009	Lexington	3758994	495118	Cayce CMS	Cayce	43	280	124	122	117	111	0.00
45-079-0007	Richland	3772362	503461	Parklane-State Park Health Ctr	Columbia	22	52	51	48	42	38	0.00
45-079-0007	Richland	3772362	503461	Parklane-State Park Health Ctr**	Columbia	34*	17	55	51	48	48	0.00
45-079-0014	Richland	3760080	498168	Enright (Rex) Athletic Ctr (USC)	Columbia	24	56	51	51	43	38	0.00
45-079-0018	Richland	3759977	496267	Olympia	Columbia	43	331	143	130	129	123	0.00
45-079-1003	Richland	3764661	496637	DHEC Parking Lot	Columbia	24*	47	48	47	41	37	0.00
45-079-1003	Richland	3764661	496637	DHEC Parking Lot	Columbia	23*	53	55	49	45	40	0.00
45-083-0001	Spartanburg	3867430	414832	Spartanburg City Hall	Spartanburg	23*	49	56	43	42	40	0.00
45-091-0005	York	3868729	499902	Rock Hill Water Filter Plant	Rock Hill	26*	51	50	46	46	45	0.00

* Indicates that there is not enough data to calculate concentrations relative to the standard.

** Temporary site used during the Heritage Building construction.

Total Suspended Particulate (TSP) - $\mu\text{g}/\text{m}^3$

[Air quality standard = $75 \mu\text{g}/\text{m}^3$]

<u>Site ID</u>	<u>County</u>	<u>Site Name</u>	<u>UTM-N</u>	<u>UTM-E</u>	<u>City</u>	<u>Obsv.</u>	<u>Geom. Mean</u>	<u>1st 24-hr Max.</u>	<u>2nd 24-hr Max.</u>	<u>3rd 24-hr Max.</u>	<u>4th 24-hr Max.</u>
45-003-1001	Aiken	Beech Island Fire Station	3699184	417032	None	55	36	189	101	81	71
45-007-0001	Anderson	D.S.S. Bldg.	3818862	348235	Anderson	13	31*	55	49	48	47
45-079-1006	Richland	Congaree Swamp Nat'l Mon't	3741586	516032	None	48	19*	41	38	35	34
45-019-0003	Charleston	Jenkins Ave Fire Station	3638530	595616	N.Charleston	57	35	85	82	78	78
45-019-0037	Charleston	James Island Fire Station #2	3622064	596804	None	52	31*	63	61	60	53
45-019-0046	Charleston	Cape Romain Wildlife Refuge	3645423	625453	None	58	22	64	41	38	38
45-019-0047	Charleston	US Naval Base II	3634161	598429	N.Charleston	61	32	90	81	76	74
45-033-0001	Dillion	City-County Office Bldg.	3809381	649333	Dillon	60	35	96	90	76	72
45-043-0002	Georgetown	Howard High School	3693466	658374	Georgetown	48	48*	100	87	84	81
45-043-0006	Georgetown	Georgetown CMS	3692719	658700	Georgetown	54	83	337	217	187	186
45-043-0007	Georgetown	Maryville Power Sub Station	3691150	658390	Georgetown	57	23	54	42	39	26
45-043-0009	Georgetown	Winyah	3693835	659450	Georgetown	59	44	113	111	109	99
45-045-0008	Greenville	Greenville Health Dept.	3855853	371711	Greenville	54	34*	91	76	66	61
45-045-1002	Greenville	Parker Fire Station	3859360	370265	Greenville	60	39	77	74	71	70
45-045-2002	Greenville	1st Baptist Church Annex	3866843	387695	Greer	57	29	71	64	59	58
45-045-8001	Greenville	Bent Creek (Exide)	3866460	384647	None	51	23*	82	57	50	47
45-047-0001	Greenwood	Greenwood Cty DSS	3782434	393798	Greenwood	59	27	70	62	62	60
45-049-0001	Hampton	Hampton I	3637089	490541	Hampton	47	31*	83	66	63	63
45-051-0002	Horry	Myrtle Beach EQC Office	3731000	696714	Myrtle Beach	57	30	88	58	55	49
45-055-0001	Kershaw	Kershaw Cty Health Dept.	3789381	536017	Camden	55	28	57	52	50	50
45-063-0002	Lexington	Lake Murray Technology Ctr	3769609	483970	Irmo	53	34	101	91	73	72
45-063-0004	Lexington	Spires (Gaston)	3739417	490456	None	59	21	57	46	46	46
45-063-0005	Lexington	Saltech (Gaston-Fallaw)	3737992	488895	None	49	21*	55	54	51	51
45-063-0008	Lexington	Seven Oaks Rec Ctr	3767611	485683	Irmo	57	31	81	60	58	55
45-063-1002	Lexington	Cayce Fire Station	3758509	493949	Cayce	56	35*	103	96	82	71
45-079-0006	Richland	SCPPPS	3762555	497833	Columbia	55	35*	80	78	73	68
45-079-0007	Richland	Parklane - State Park Health Ctr	3772362	503461	Columbia	44	29*	70	60	57	54
45-079-0014	Richland	Enright (Rex) Athletic Ctr (USC)	3760080	498168	Columbia	45	36*	93	77	76	62
45-079-1003	Richland	DHEC Parking Lot	3764661	496637	Columbia	58	33	84	71	67	63
45-083-0001	Spartanburg	Spartanburg City Hall	3867430	414832	Spartanburg	39	27*	59	59	56	55
45-083-0007	Spartanburg	Roebuck-Cromer	3860169	410973	None	57	25	56	52	51	48
45-083-0008	Spartanburg	Roebuck-Pecan	3859648	411719	None	36	26*	50	50	48	46
45-091-0005	York	Rock Hill Water Filter Plant	3868729	499902	Rock Hill	44	44*	77	75	73	69

* Indicates that there is not enough data to calculate concentrations relative to the standard.

** Temporary site used during the Heritage Building construction.

Carbon Monoxide (CO)

[Air quality standard = 35 ppm (40 µg/m³-1hr), 9 ppm (10µg/m³-8hr)]

Site ID	County	UTM-N	UTM-E	Site Name	City	Observations	1st 1-hr Max.		2nd 1hr Max.		≥ 35	1st 8-hr Max.		2nd 8-hr Max.		≥ 9
							ppm	µg/m ³	ppm	µg/m ³		ppm	µg/m ³	ppm	µg/m ³	
45-019-0005	Charleston	598588	3628743	Ashe Street	Charleston	8673	8.6	9.804	8.0	9.120	0	4.3	4.902	3.9	4.446	0
45-045-0008	Greenville	371711	3855853	Greenville Health Dept.	Greenville	8444	7.7	8.778	7.2	8.208	0	6.1	6.954	5.6	6.384	0
45-079-0013	Richland	496131	3763364	Wardlaw	Columbia	7846	6.7	7.638	4.5	5.130	0	3.8	4.332	2.9	3.306	0

Sulfur Dioxide (SO₂)

[Air quality standard = 80 µg/m³-annual, 365µg/m³-24hr, 1300 µg/m³-3hr]

Site ID	County	UTM-N	UTM-E	Site Name	City	Anth. Mean		Obsv.	1st Max. 24-hr		2nd Max. 24-hr		≥0.14	1st Max. 3-hr		2nd Max. 3-hr		≥0.50
						ppm	µg/m ³		ppm	µg/m ³	ppm	µg/m ³		ppm	µg/m ³	ppm	µg/m ³	
45-003-0003	Aiken	3689293	426589	Jackson Middle School	None	0.002	5.22	8639	0.009	23.49	0.008	20.88	0	0.027	70.47	0.023	60.03	0
45-011-0001	Barnwell	3686689	456659	Barnwell CMS (Road S-6-21)	None	0.001	2.61	8358	0.005	13.05	0.004	10.44	0	0.022	57.42	0.017	44.37	0
45-019-0003	Charleston	3638530	595616	Jenkins Ave Fire Station	N. Charleston	0.003	7.83	8243	0.029	75.69	0.022	57.42	0	0.061	159.21	0.061	159.21	0
45-019-0046	Charleston	3645423	625453	Cape Romain Wildlife Refuge	None	0.001	2.61	8608	0.005	13.05	0.005	13.05	0	0.024	62.64	0.018	46.98	0
45-043-0006	Georgetown	3692719	658700	Georgetown CMS	Georgetown	0.001	2.61	8443	0.010	26.10	0.006	15.66	0	0.029	75.69	0.025	65.25	0
45-045-0008	Greenville	3855853	371711	Greenville Health Dept.	Greenville	0.003	7.83	8605	0.015	39.15	0.014	36.54	0	0.037	96.57	0.029	75.69	0
45-063-0008	Lexington	3767611	485683	Seven Oaks Recreational Ctr	Irmo	0.004	10.44	8573	0.028	73.08	0.020	52.20	0	0.112	292.32	0.077	200.97	0
45-073-0001	Oconee	3853517	295290	Round Mt Fire Tower (Long.)	None	0.001	2.61	8451	0.009	23.49	0.009	23.49	0	0.019	49.59	0.016	41.76	0
45-079-0007	Richland	3772362	503461	Parklane-State Park Health Ctr	Columbia	0.002	5.22	6894	0.013	33.93	0.009	23.49	0	0.049	127.89	0.035	91.35	0
45-079-0007	Richland	3772362	503461	Parklane-State Park Health Ctr**	Columbia	0.001?	2.61?	2801	0.004	10.44	0.004	10.44	0	0.016	41.76	0.014	36.54	0
45-079-1003	Richland	3764661	496637	DHEC Parking Lot	Columbia	0.002	5.22	8683	0.009	23.49	0.009	23.49	0	0.034	88.74	0.030	78.30	0
45-079-1006	Richland	3741586	516032	Congaree Swamp Nat'l Mon't	None	0.001	2.61	8118	0.014	36.54	0.008	20.88	0	0.037	96.57	0.030	78.30	0

** Temporary site used during the Heritage Building construction.

For modeling purposes, use the following concentration values in determining background concentrations:

TSP: Annual: Geometric Mean PM₁₀: Annual: Arithmetic Mean 24 Hour: 2nd Maximum Value	NO₂: Annual: Arithmetic Mean CO: 8 Hour: 2nd Maximum Value 1 Hour: 2nd Maximum Value	SO₂: Annual: Arithmetic Mean 24 Hour: 2nd Maximum Value 3 Hour: 2nd Maximum Value
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Notes

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